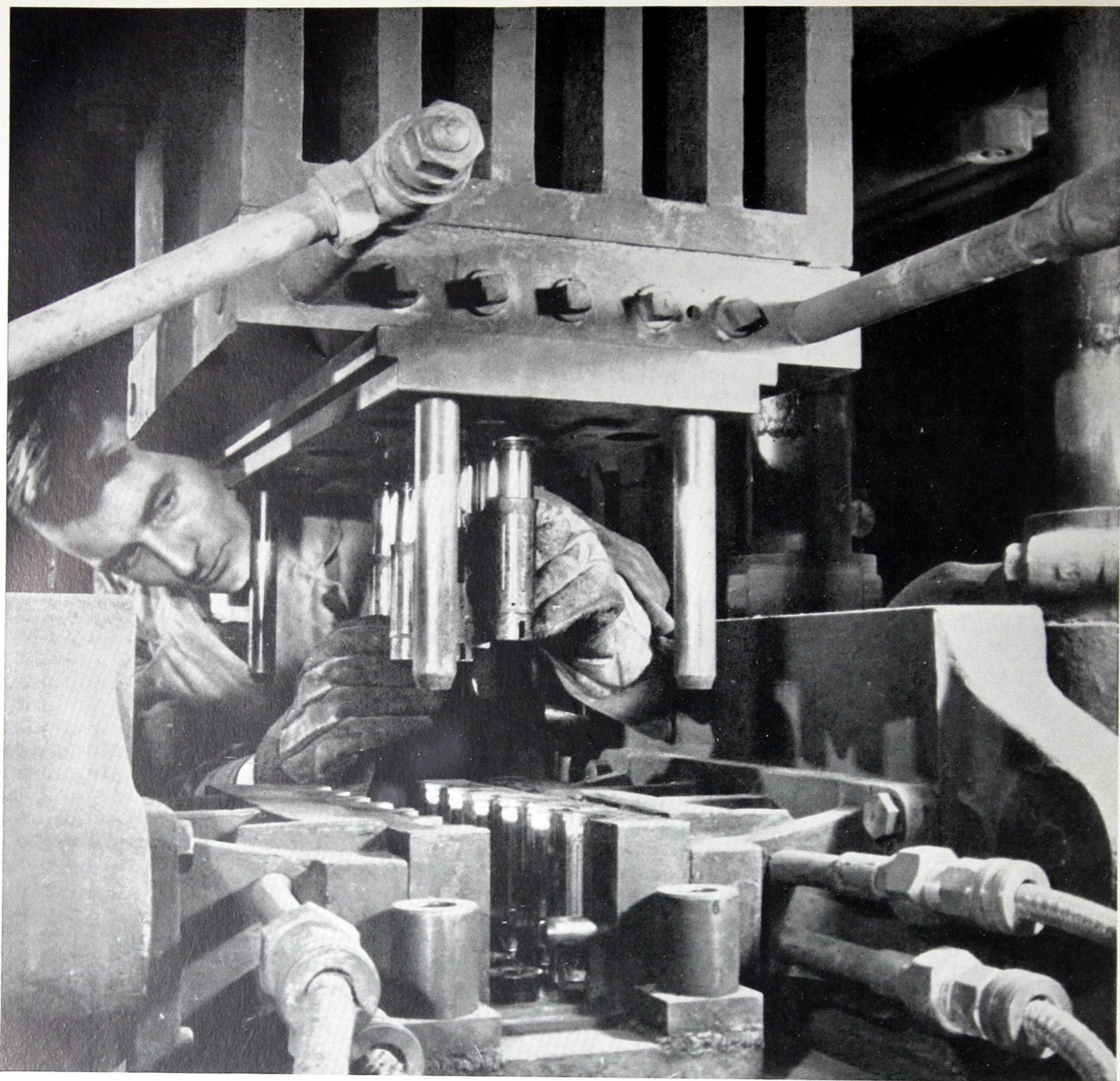


1095-11



shaping the future



The production of perfect mouldings demands a steady pressure of between one and four tons per square inch of surface, along with accurate and unfluctuating temperature. These conditions are provided by the hydraulic press, with steel steam chests or electric platens. In the press the highly-polished moulds of hardened steel are locked. There are a few accessory requirements, the whole involving the services of a staff of engineers and skilled machinists, but the moulder's view is shown in these pictures.

Above: electric torch bodies are being stripped from a "split" mould. At right the operator is removing the last of a set of tumblers, prior to refilling the mould.



1090-83133

INTRODUCTION

Ten years ago they were scarcely known ; to-day they are everywhere, lending colour beauty, strength and durability to a thousand things—improving a multitude of everyday products besides aiding the engineer and the scientist. Plastics are the most wonderful and versatile materials of the twentieth century.

This book shows only a few representative uses. A glance through its pages will suggest others to you—one or more of which may apply to your own business. If it does that, if it suggests something that you could make better or, maybe, more cheaply, in Plastics, it will have done its job.

Most Plastics are made from simple chemical compounds which are available in unlimited quantities. They include forms as elastic as rubber, or as tough as steel ; of feather weight to medium heavy ; as clear as crystal or opaque as ebony. Plastics can be cast or moulded into forms proof against wear and tear and weather ; into sections thin as paper or thick as a railway sleeper ; in all colours of the rainbow ; with surfaces engraved, lettered or embossed. Plastics can serve as a base for hard, brilliant lacquers ; as a glue for furniture ; even for proofing textiles against creasing.

Perhaps the most versatile of all Plastics are those known to chemists as the amino group. And it is these which are developed by BRITISH INDUSTRIAL PLASTICS, LTD.—under the trade names Beetle, Scarab and Pollopas.

MOULDINGS

By the simultaneous application of heat and pressure the B.I.P. Mould-stuffs can be moulded to almost any shape. This simple treatment converts them into hard, stable mouldings unaffected by temperatures ordinarily encountered ; resistant to moisture and most chemicals ; odourless, non-corrosive, non-inflammable, inert, and therefore almost infinitely durable. These mouldings are tough and strong, yet light in weight ; they are excellent insulators of sound, heat and electricity ; they can be made in any colour, including marbled forms, and with embossed, engraved or lettered designs. Where necessary parts can be formed with internal or external screw threads, or they can be drilled, tapped or machined afterwards.

LACQUERS AND ENAMELS

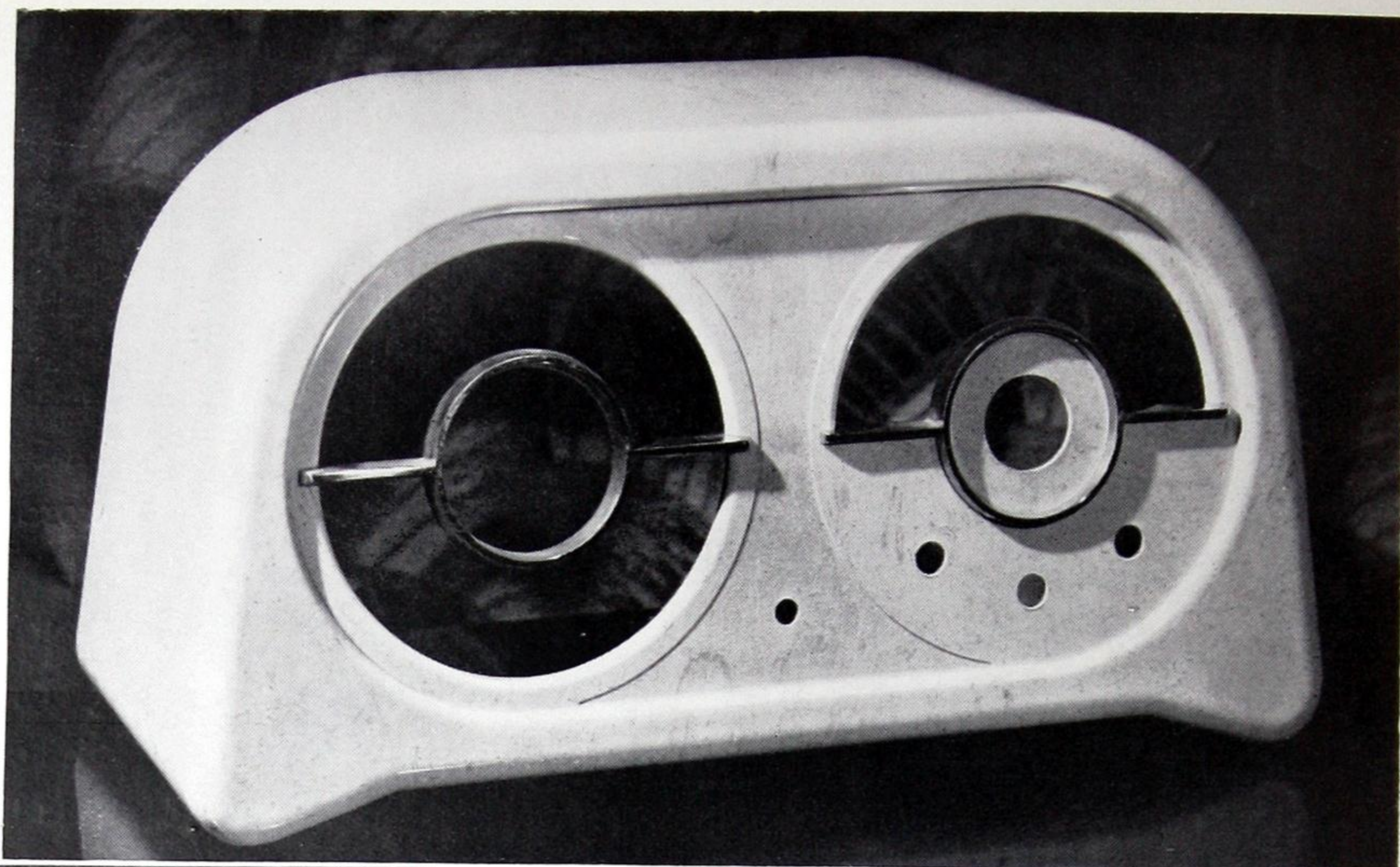
Another use of B.I.P. Plastics is as a base for lacquers. For this purpose, B.I.P. produce Beetle Resins which are absolutely colourless and have the unique property of remaining unaffected by long exposure to light. The same resins also resist heat up to about 350° F. Thus they are ideal for the preparation of light-coloured stoving lacquers and enamels, giving exceptionally hard and flexible films.

There is no limit to the beautiful effects produced by the use of Beetle resins as the base for finishes for gas and electric stoves, refrigerators, motor-car bodies, asbestos wall panelling, and so on.

GLUES

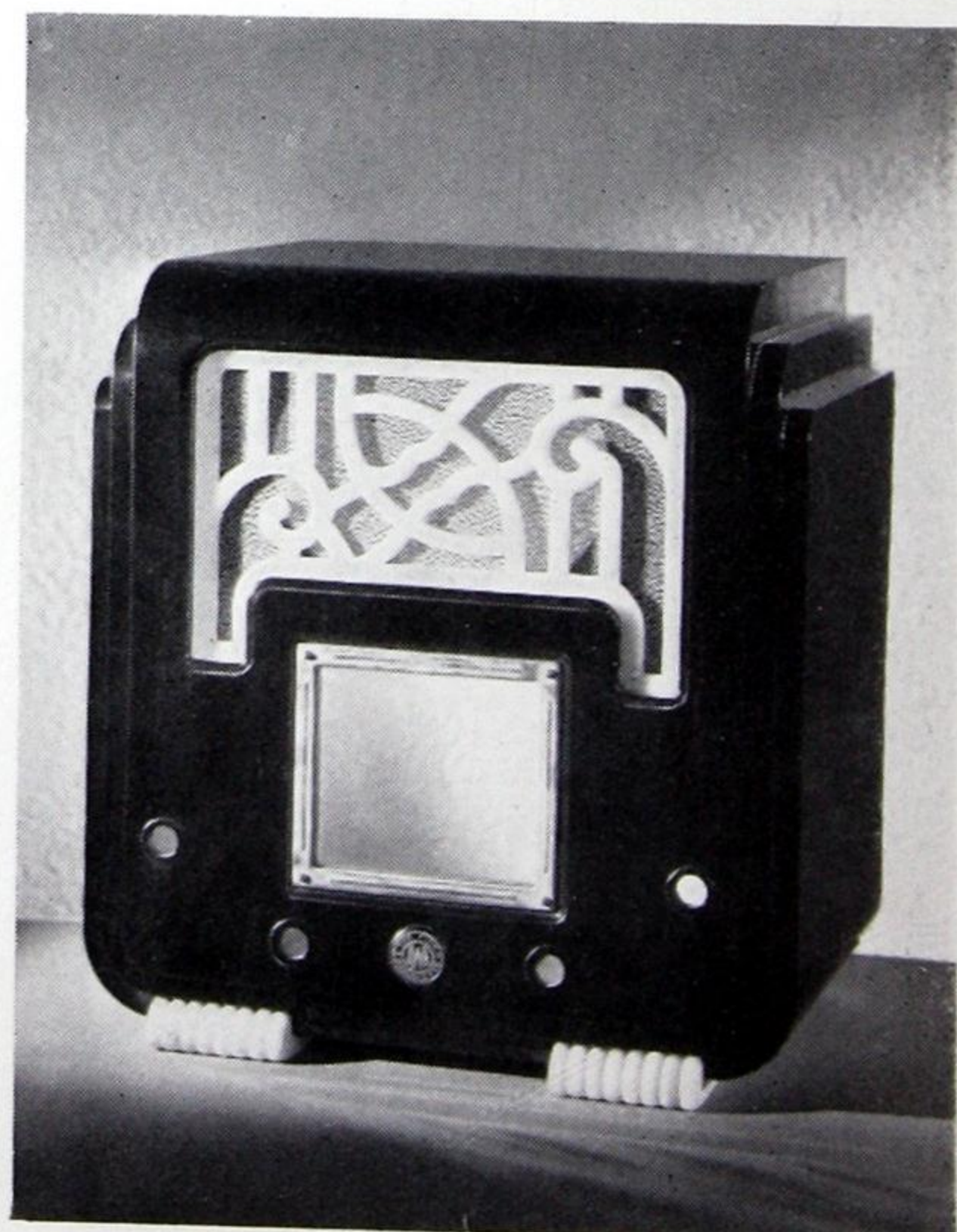
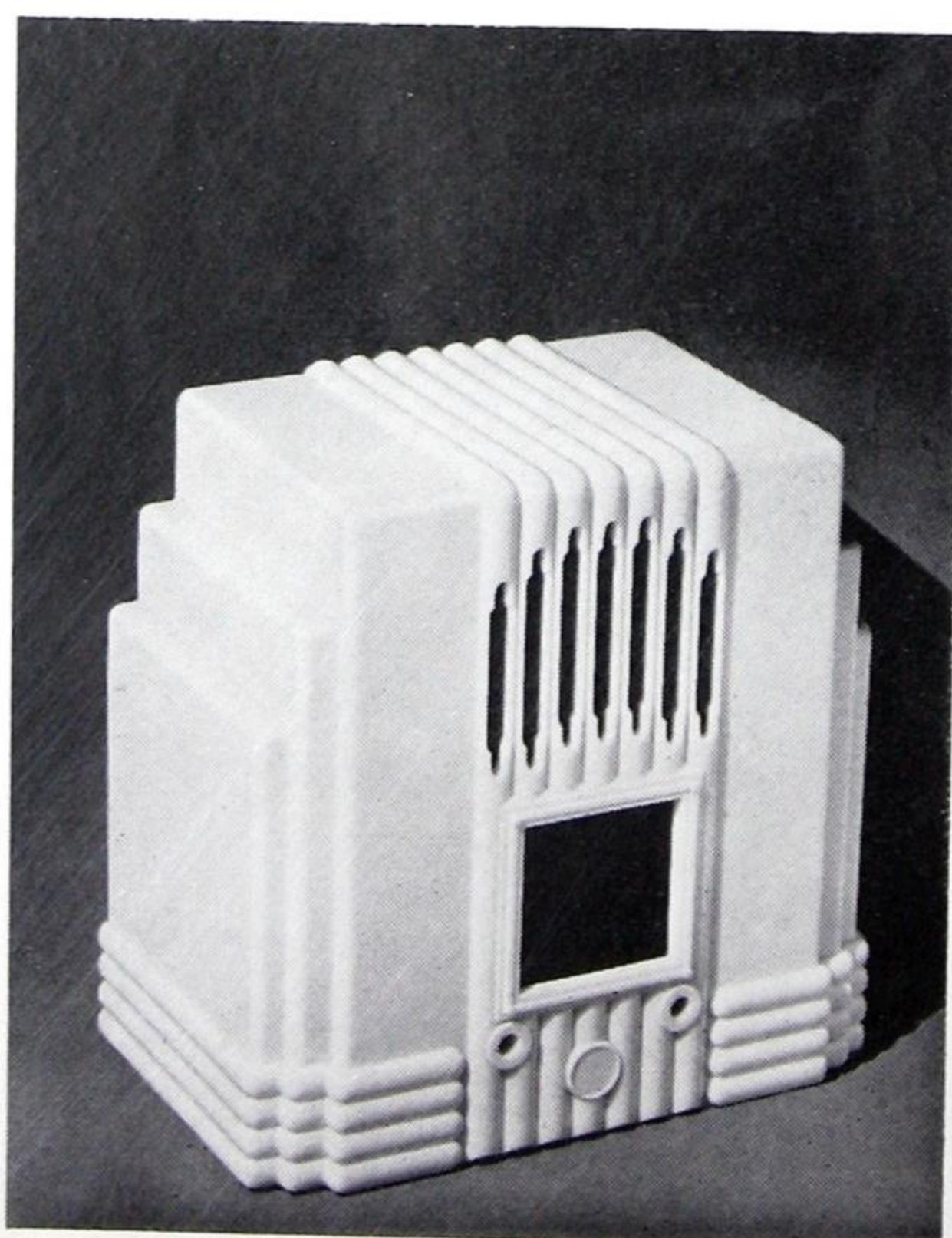
Other products of B.I.P. resins include adhesives—for example, British Kaurit Glue. This glue eliminates the danger of destruction by mould or insects which has long been a drawback to the use of veneered furniture and plywood, whilst its adhesive power is such that the joint is often stronger than the materials it joins. It resists both weathering and boiling and has passed the severe Air Ministry tests governing materials for use in aircraft construction.

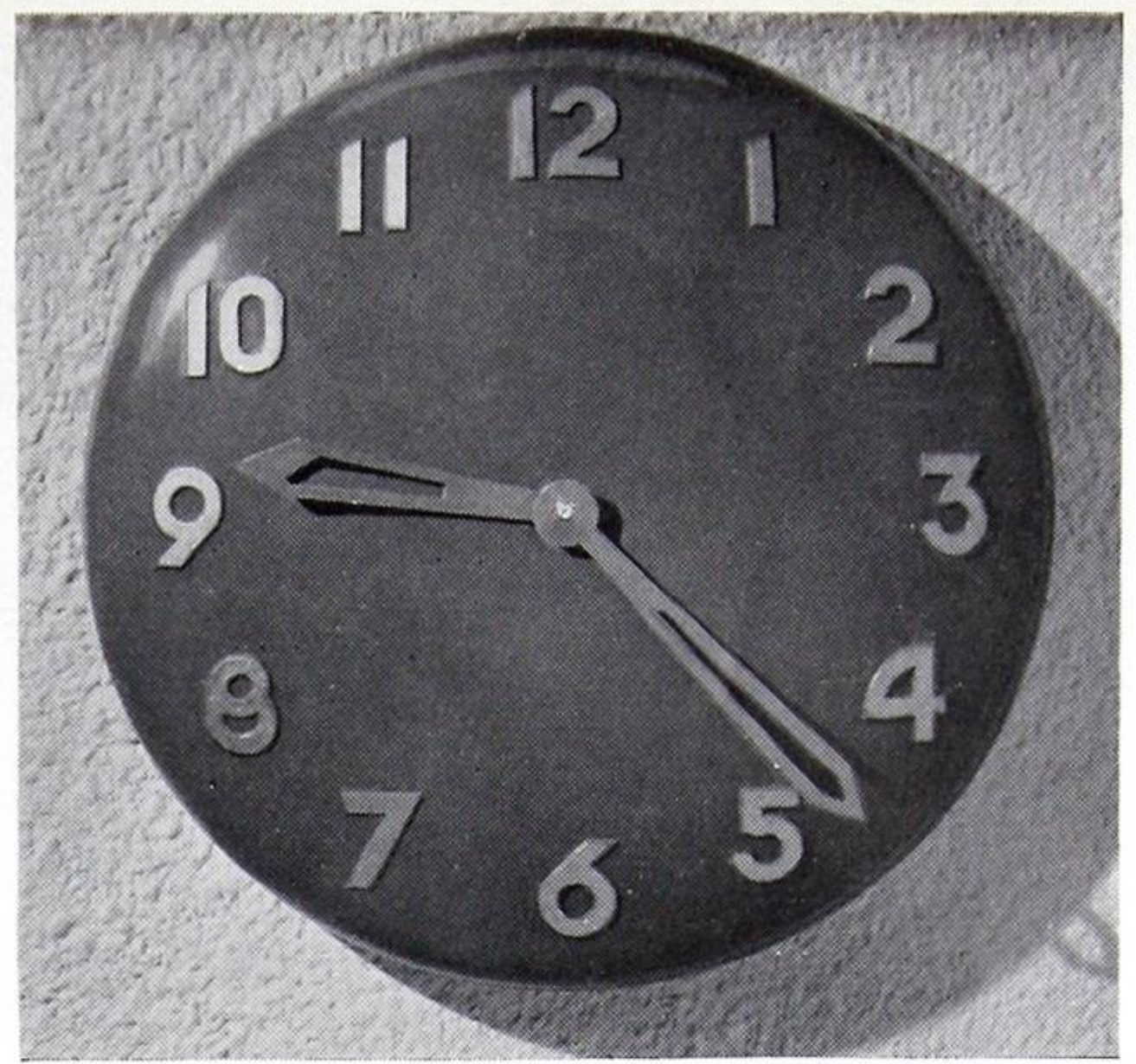
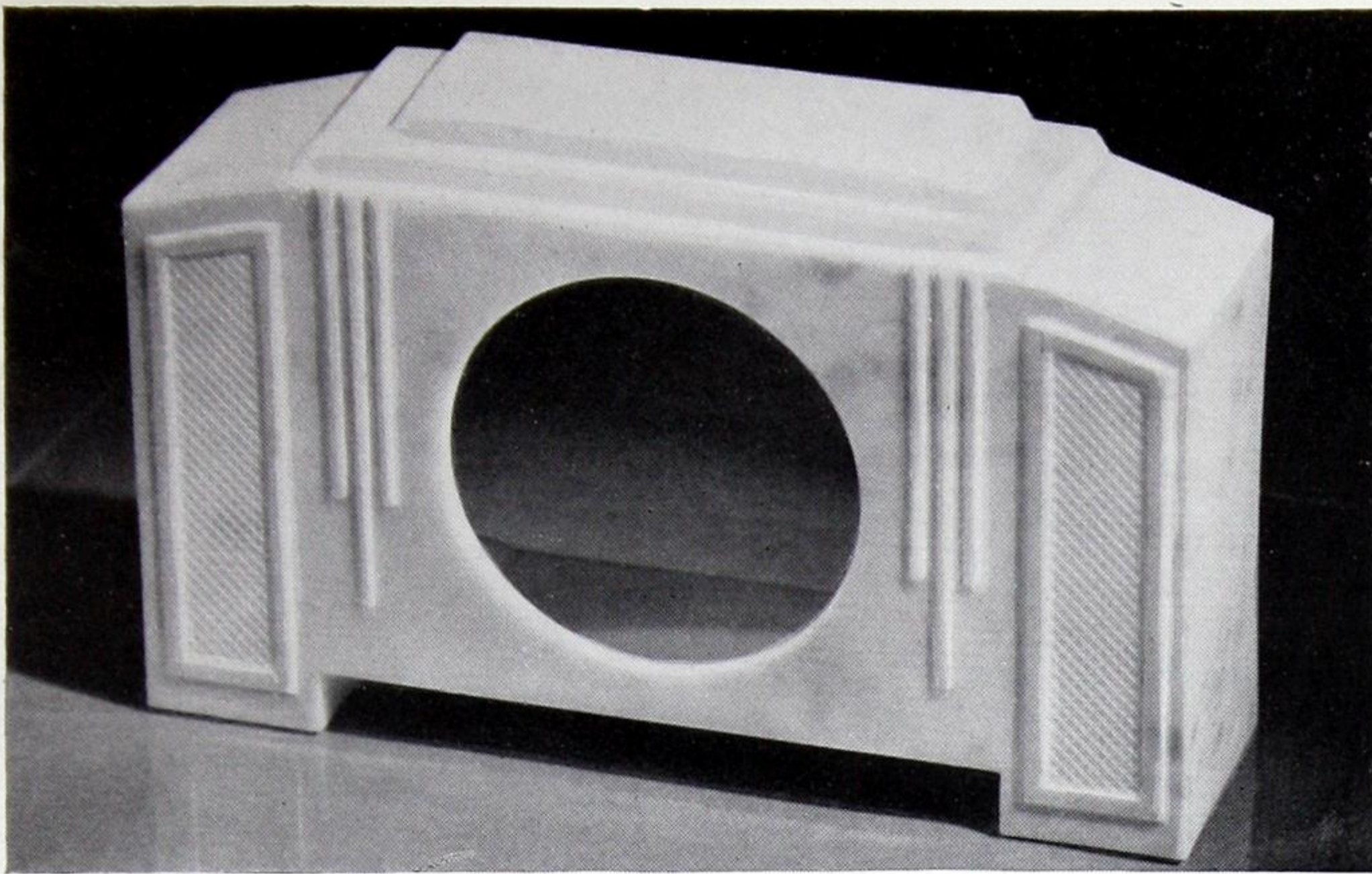
The use of mould-stuffs for radio cabinets releases the designer from the hard lines and sharp angles of wood and metal. Moreover, the delicate self colours of mould-stuffs like Scarab provide a welcome variation from the usual wood veneers. To the right, and below, designs in Scarab "biscuit."



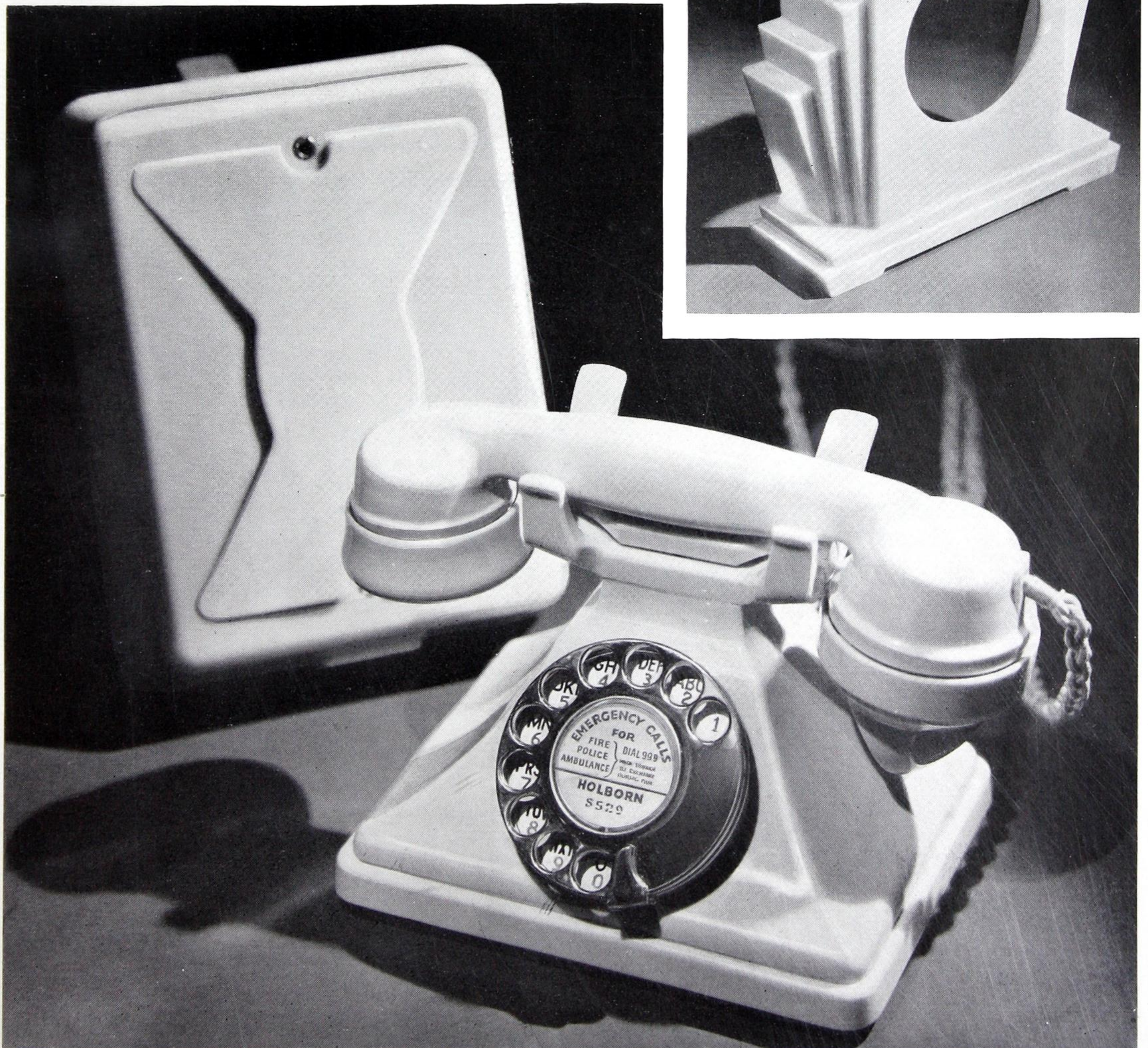
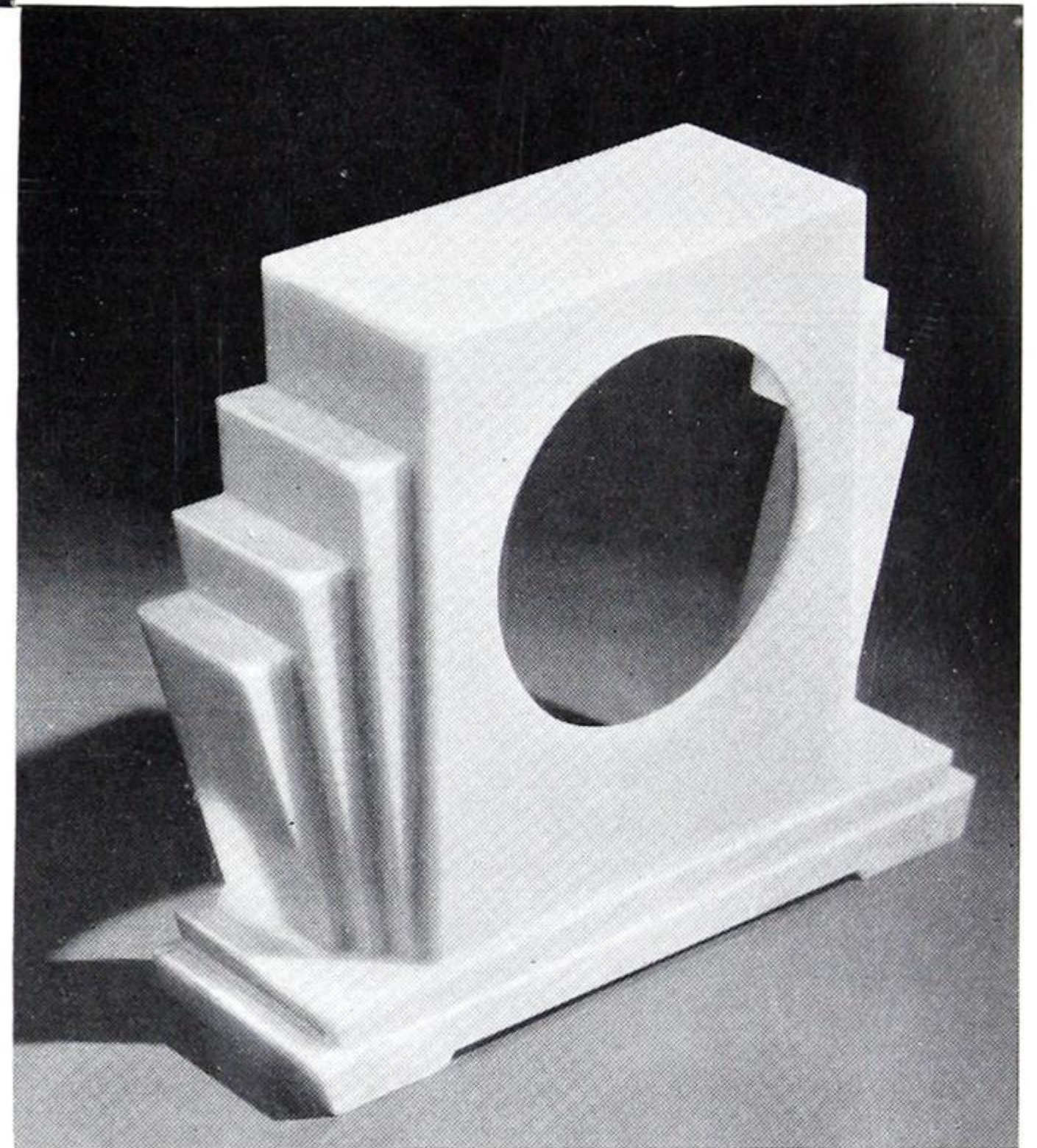
To the right a really lovely model in plain ivory, and beyond it an effective contrast—jet black cabinet, with frets and pedestals in ivory. Above this a combination of artificial wood grain and ivory fret.

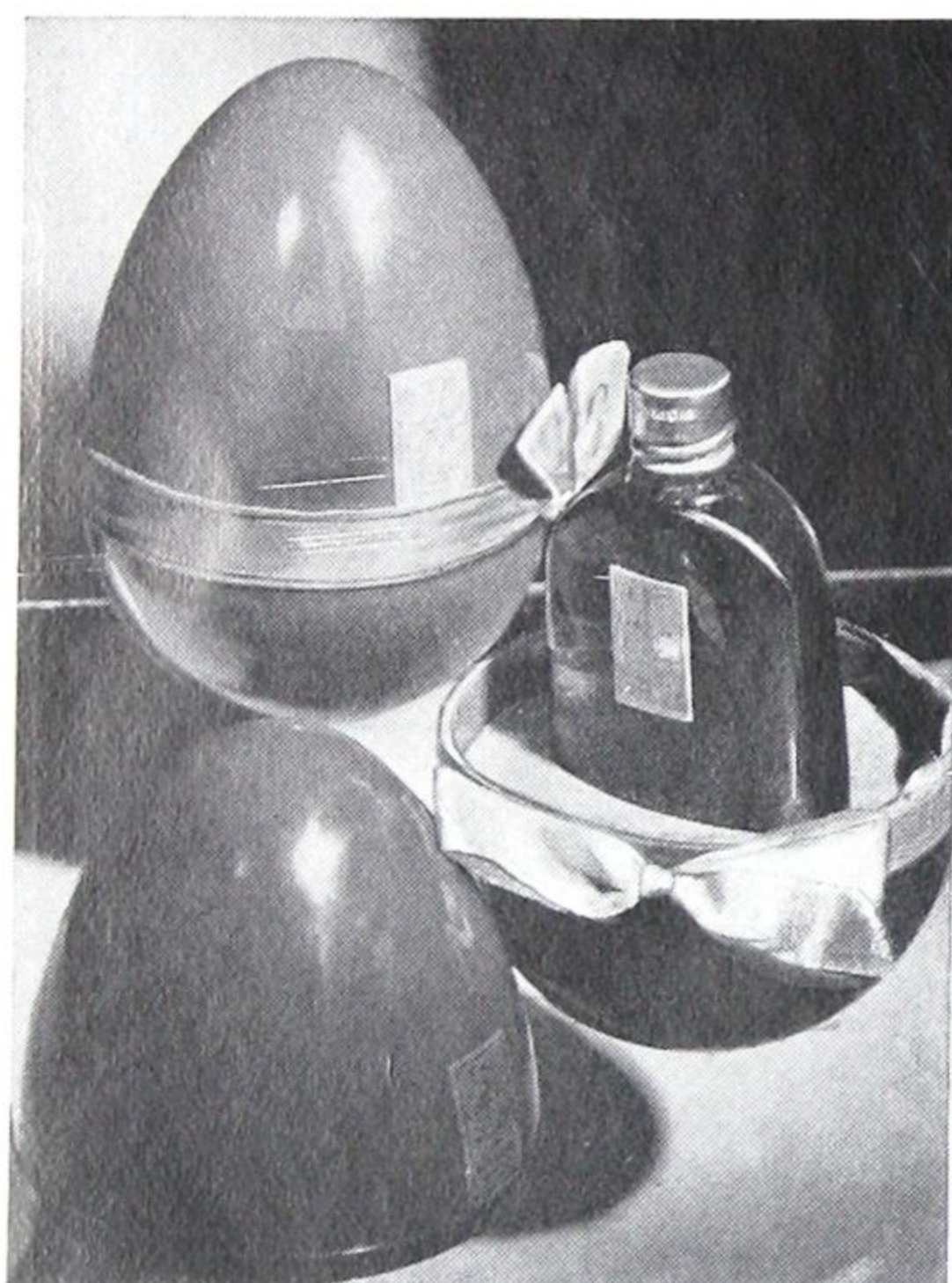
Acoustically, aesthetically, and economically there's no material to equal these B.I.P. mould-stuffs.





Mr. Anthony Bertram, broadcasting on "Design in Everyday Things," said that the Post Office hand microphone is one of the finest examples of modern functional design. Here you see it (below) moulded in Beetle, the material which fulfilled these exacting requirements — it had to insulate and protect the delicate mechanism and yet mould easily into a difficult shape ; it had to be colourful, fireproof and non-corrosive. Clock cases? The suitability of mould-stuffs is obvious. Note also the clock face—the hours moulded all in one piece with the face.

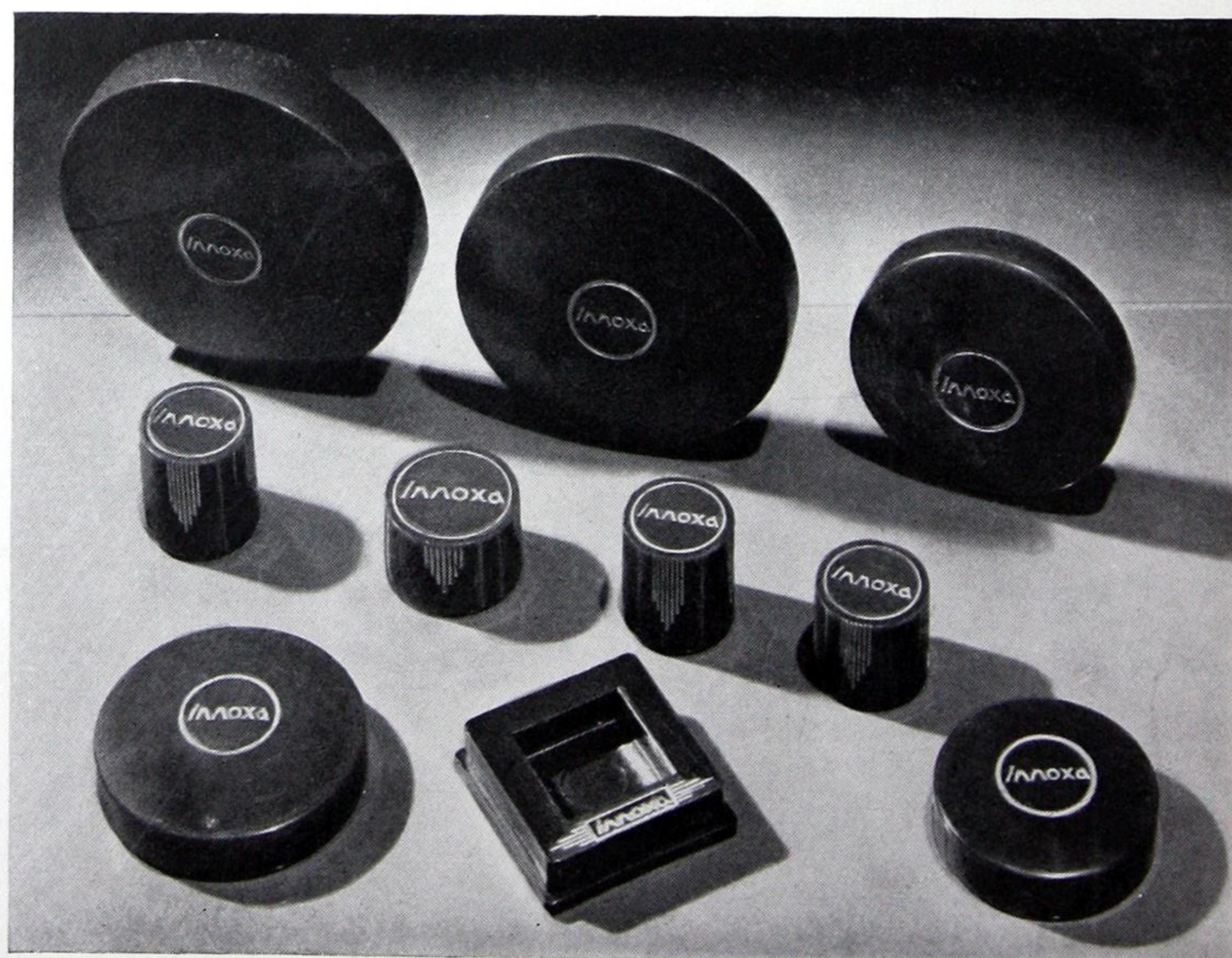




The success of a modern merchandising campaign ultimately stands or falls by—the Package. Time, thought and money spent on this essential factor are well repaid.

The packs shown here are made from Beetle and Scarab mould-stuffs. Not least of their advantages is their conformity to exact dimensions to give the correct push-on or sliding fit, or for an easy or tight screw-thread. Moulded lids, free from joins, seams or sharp edges, and in lasting, fast colours may be combined with glass, porcelain, or metal containers. Names, numbers, patterns may be engraved or printed on the moulded surface.

Powder, adhesive tape, perfume, cream, lotions, shaving soap . . . all these are associated with the mouldings shown on this page.

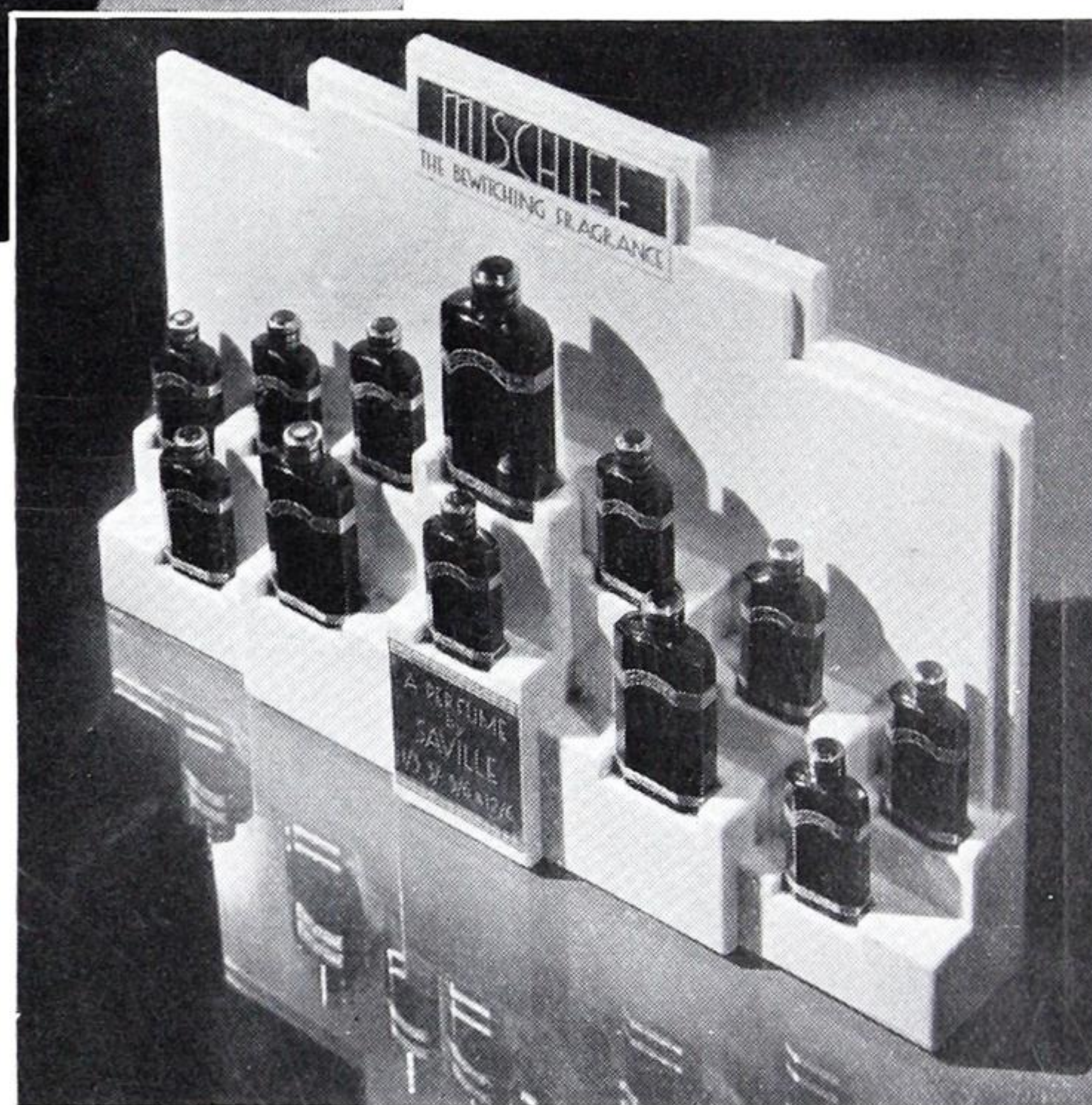




These numbers and letters for motor-car number plates are neat, durable and inexpensive. Metal rivets are firmly fixed into the reverse side during the actual process of moulding, so that they are easily fitted to the metal plate.

Below is a display stand for a well-known perfume — a striking example of the complicated shapes which mould-stuffs may assume, with shelves and recesses and relief or engraved lettering.

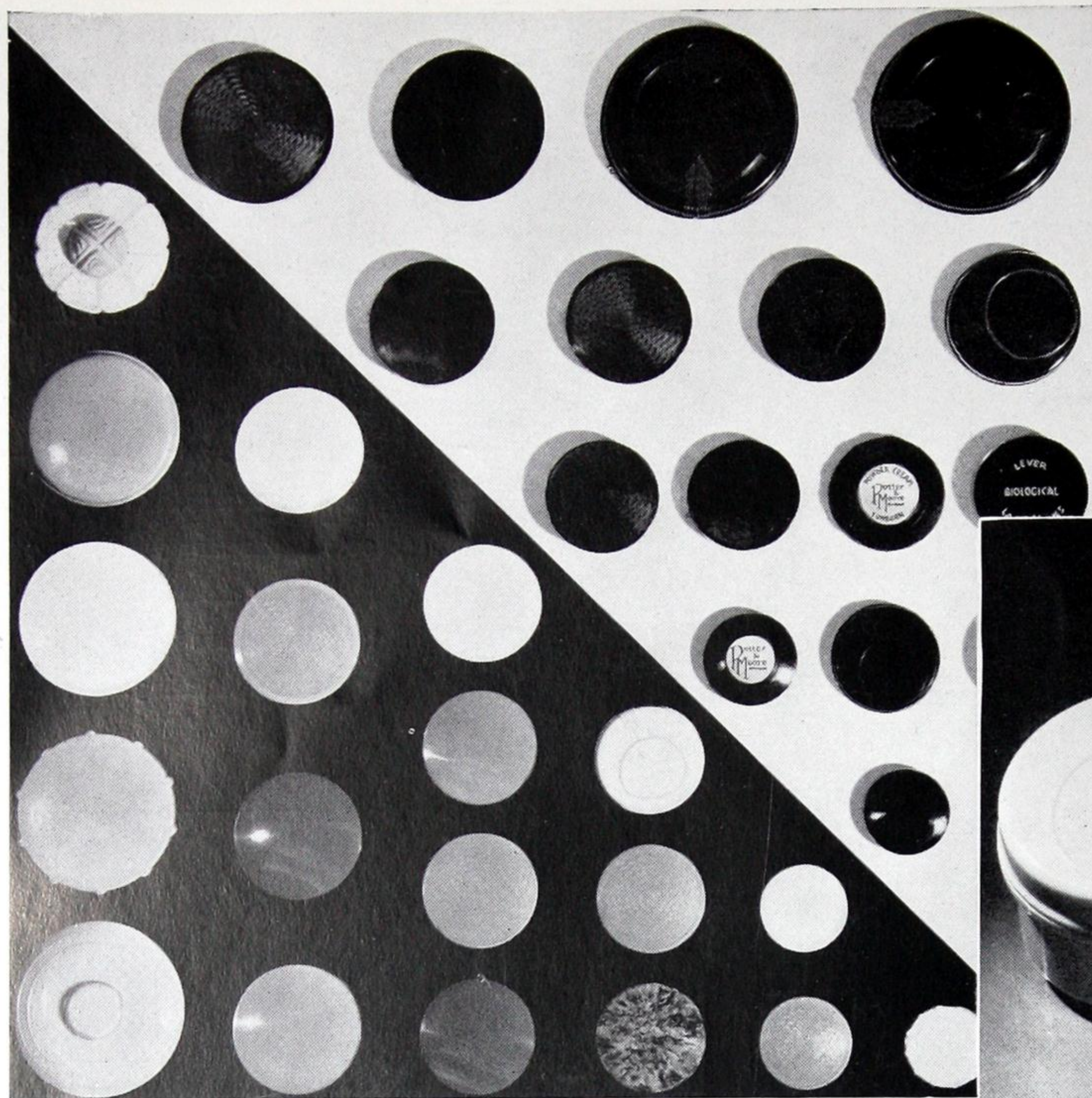
The effect of a cameo in stark, ivory Beetle on a jet black Scarab background is shown below. Alongside, a face cream jar with patterned lid in ivory Beetle.



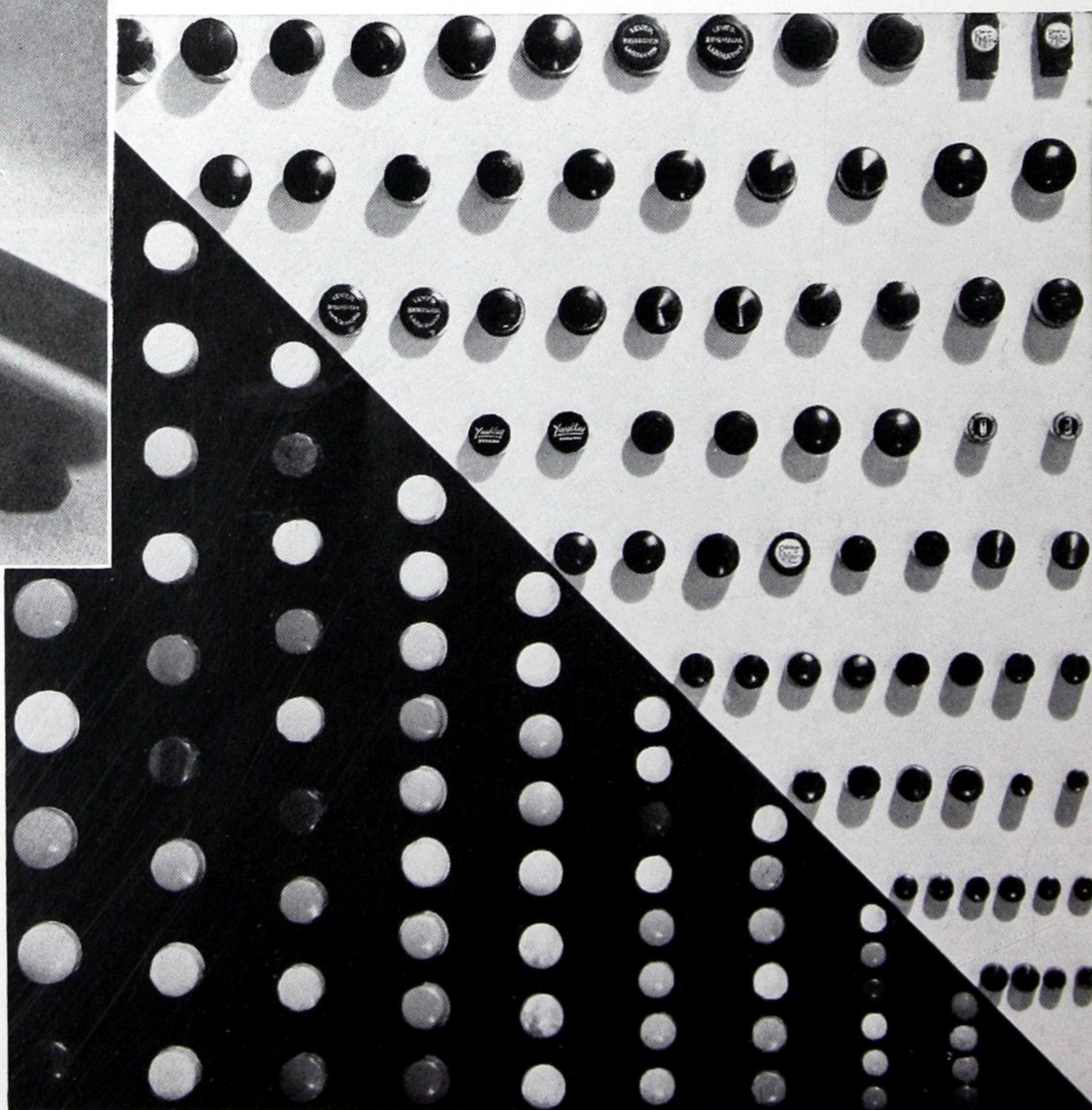
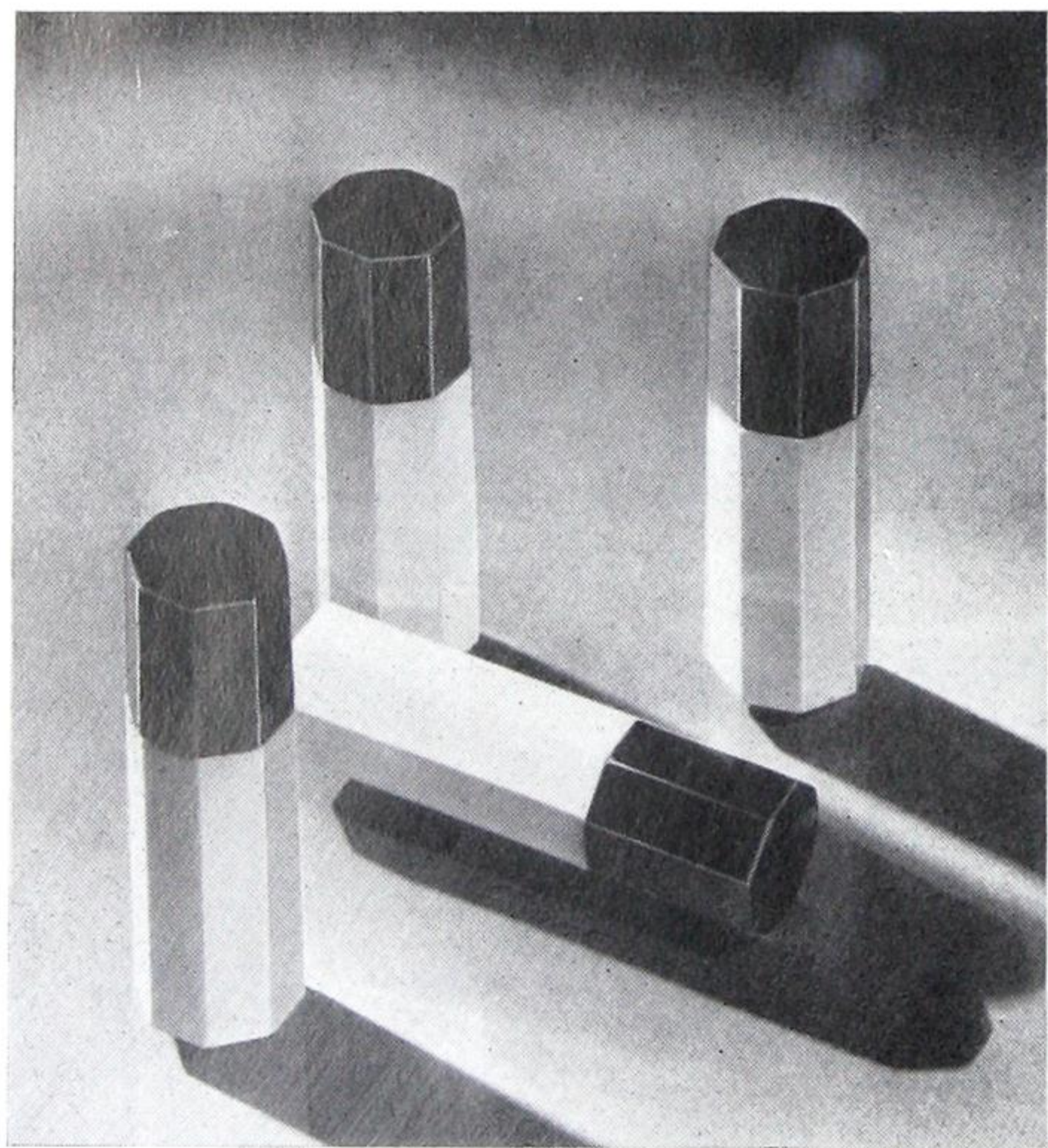
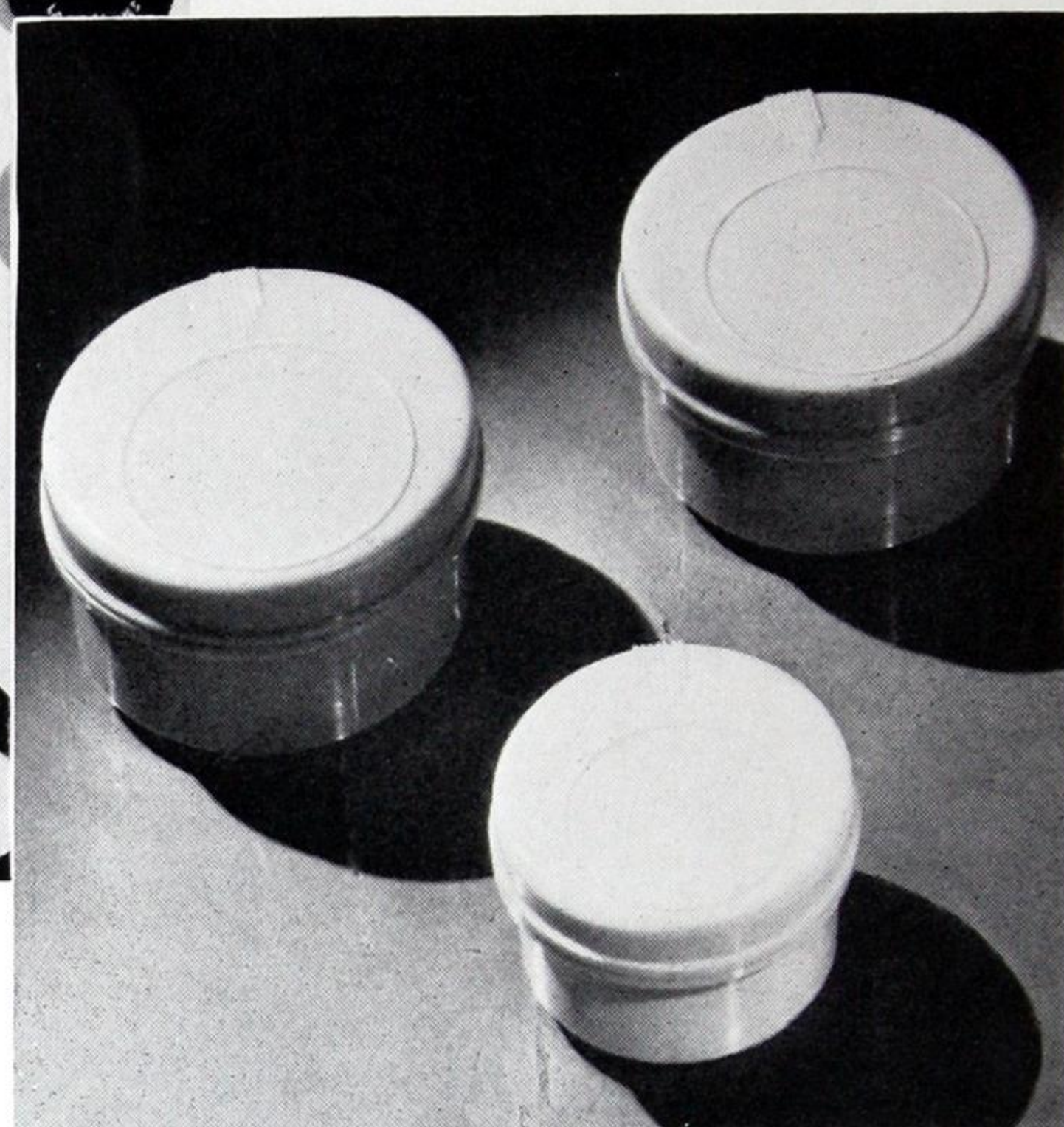
To the right, another display stand. (A point about both these stands is that unlike wood or card or metal they last and keep smart indefinitely). And the problem picture of the book—

those mysterious amorphous lumps? Sprayed black and illuminated, they function as artificial coal in a modern electric fire!





Myrrh and spikenard, lavender water and brilliantine—precious ointments from the ancient East and the secret distillations of modern chemistry—it takes a moulded cap to seal and save the fragrance of them all. Free from seams and sharp edges, the close-fitting screw and cushioned wad form a closure you can rely on.

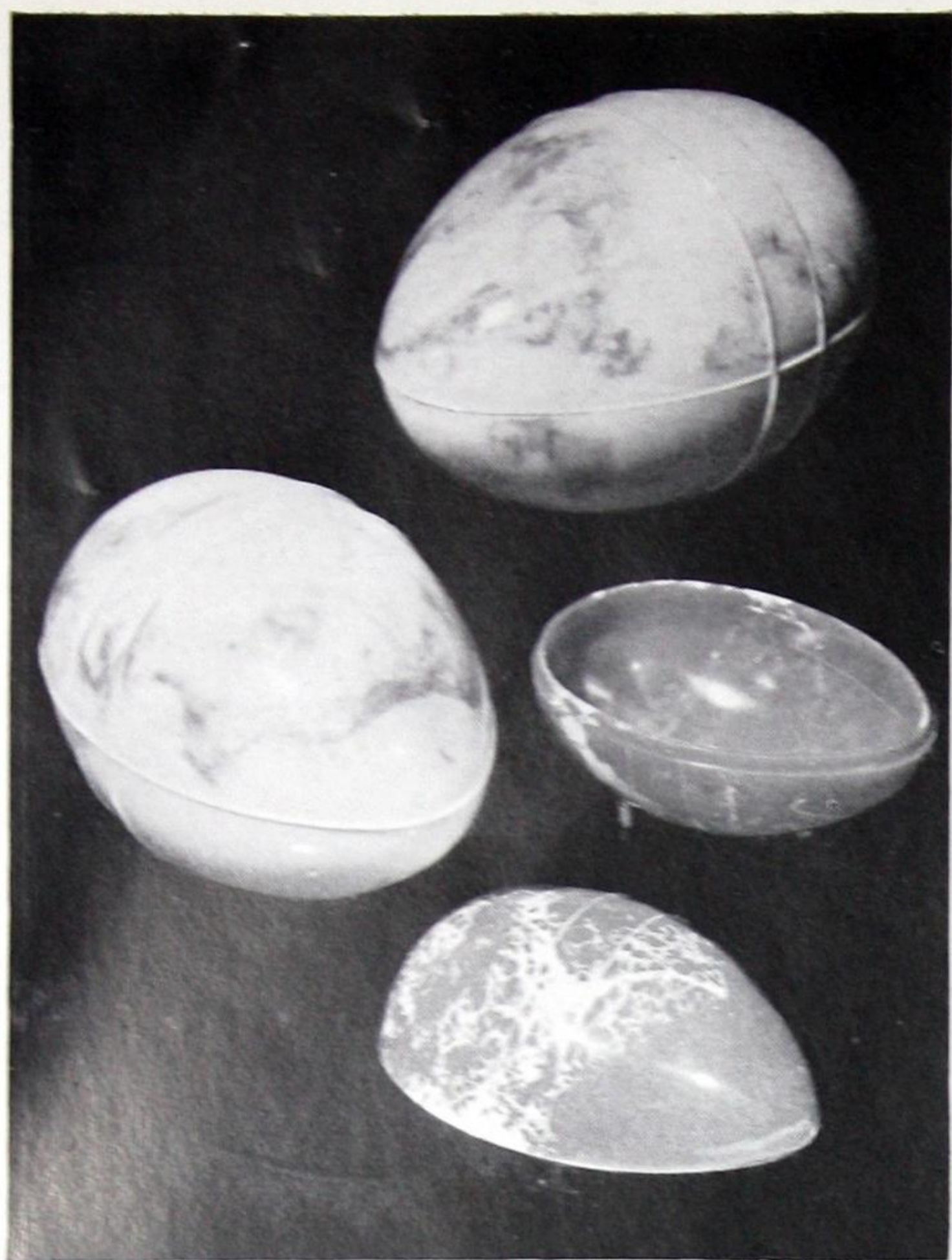


Scarab and Beetle colours are rich and decorative too. These caps may be embossed or engraved with the name or symbol of the product.

A further feature is—B.I.P. have made a special study of the selection of colours that will not run.



Even the most casual shopper must realise the enormous improvement these days in the design of bottles—and their stoppers. Tarnished metal caps, broken corks, and leaky stoppers, the clumsy shapes of the past have been banished by the scientifically designed *moulded* closure. And for this purpose—Beetle. The delicate Beetle colours look charming on a modern dressing table, and by the closely fitting screw thread and cork wad the contents are sealed efficiently.



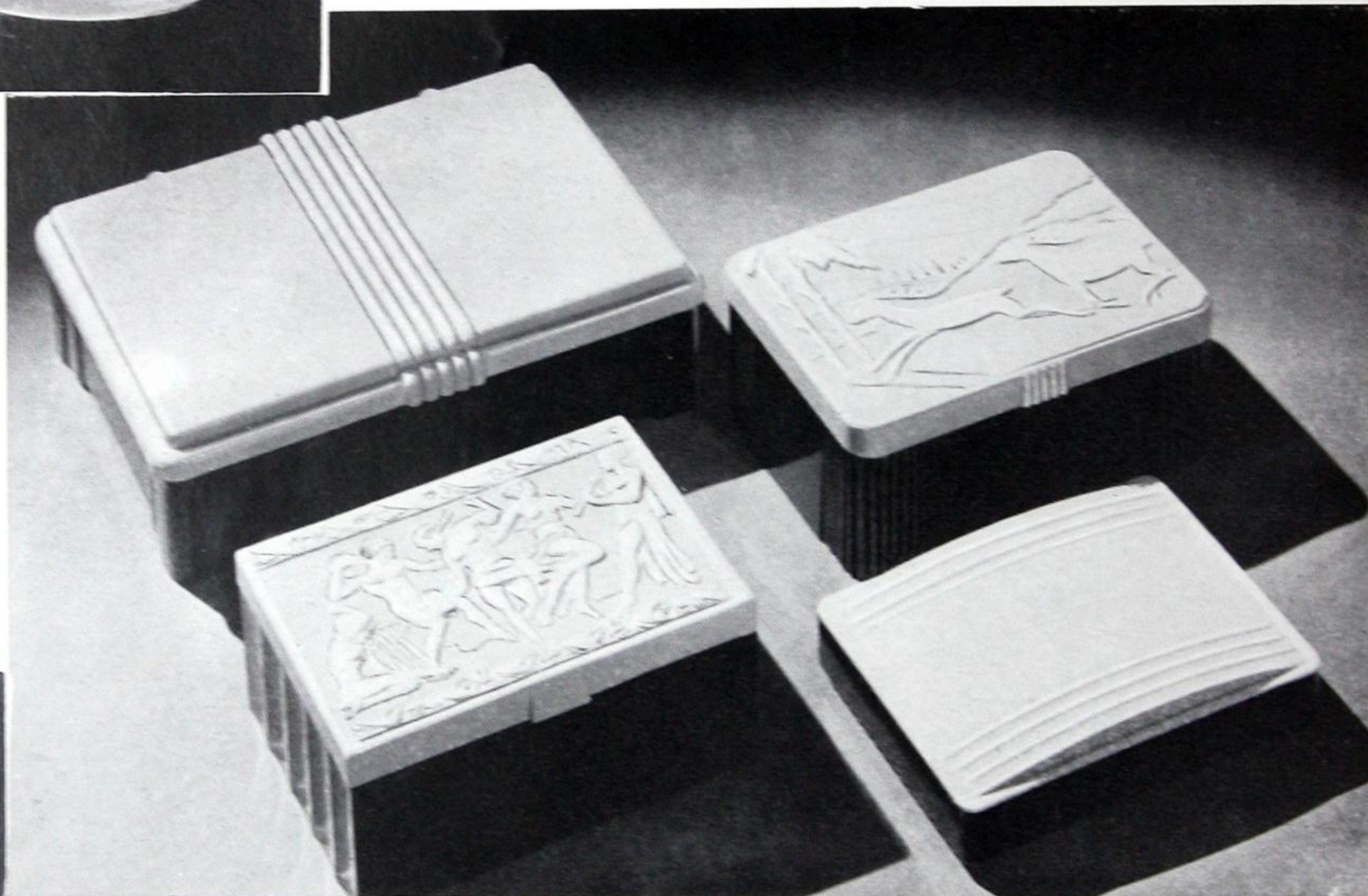
If the Great Auk and the Dodo had laid Beetle eggs many a museum would be the richer to-day. These Easter Eggs in smooth, bright Beetle, make a lovely gift and a useful, lasting reminder of the giver.

No more chipped jugs on the bar counter giving lodgment for all the germs of the air on the rough edge left. The moulded jug shown on the right remains unchipped, hygienic.

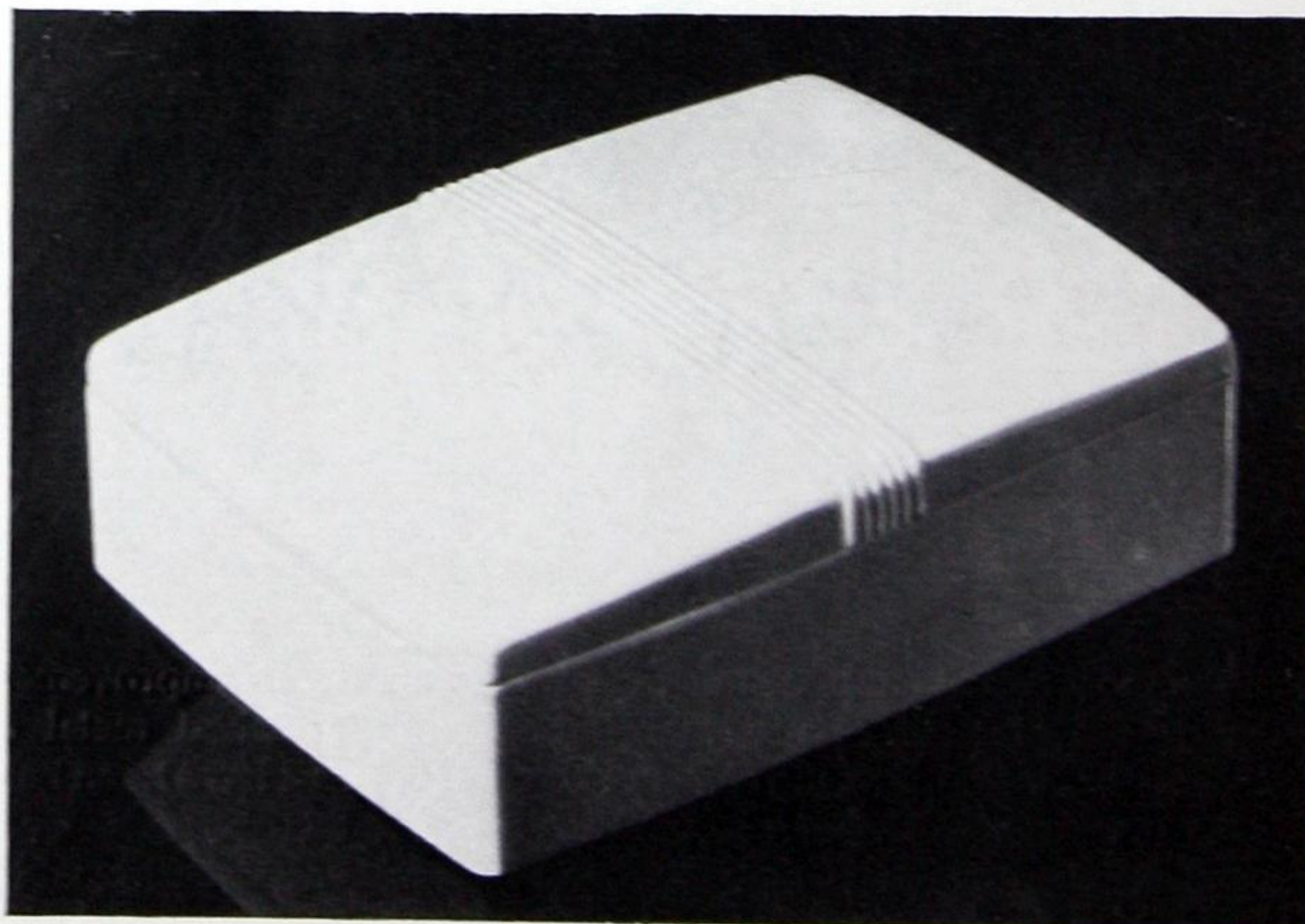


The classical designs (to the right) were made to hold a well-known brand of cigarette whose manufacturer wanted a really distinctive casket at a popular price.

The cocktail shakers are decorative on your side-board, and unlike plated metal they won't tarnish.



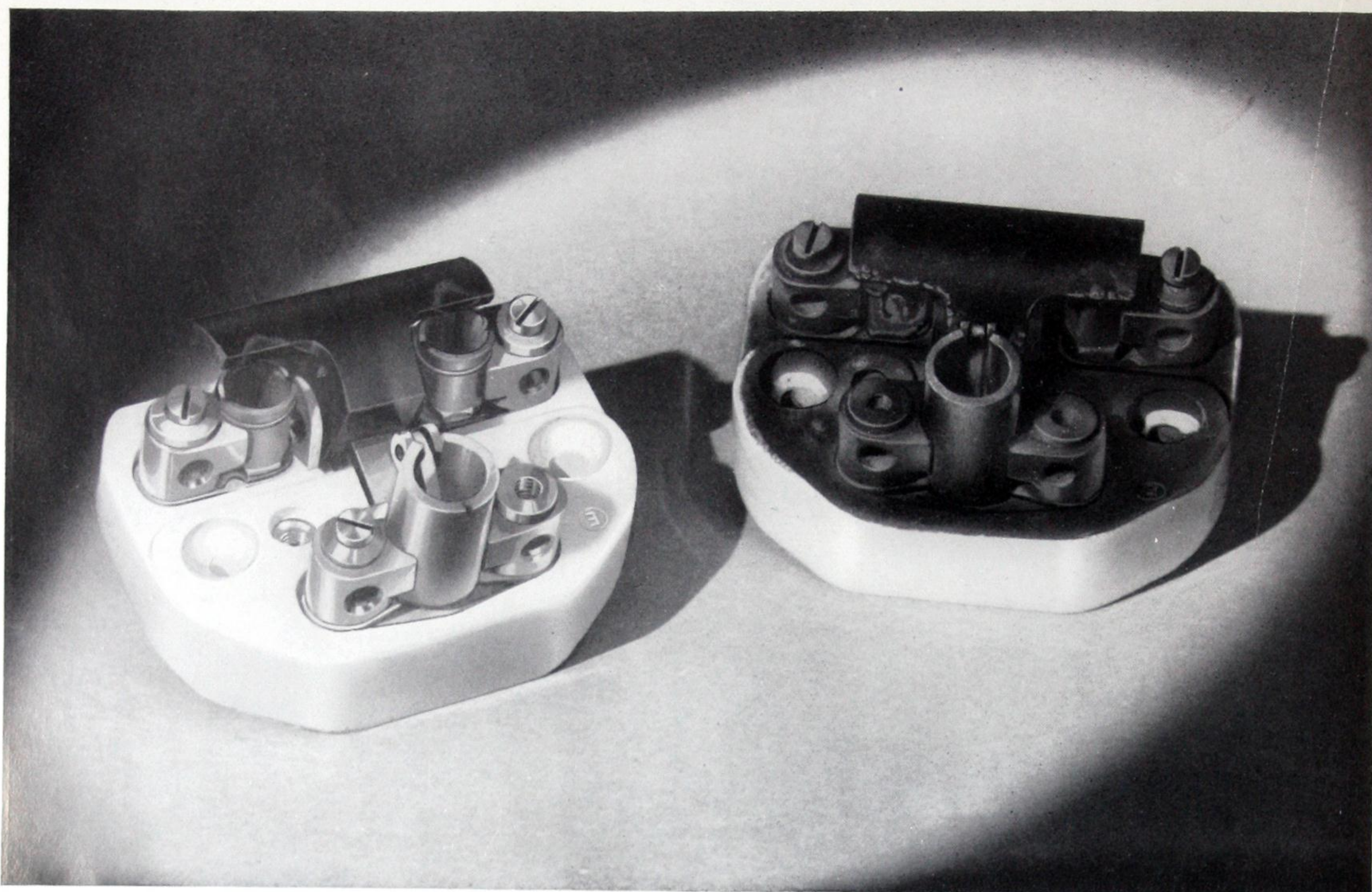
An attractive "pack" can be designed from mould-stuffs for a hundred and one everyday things. The shape and size of the contents can be closely followed, as one is not limited by the hard lines and angles of wood and metal.





On Parade ! and it would be difficult to find a smarter uniform than the black top hat in which the Saville Perfumery Company conceals its " Mischief " scent.

The military appearance of this page serves to emphasise the flawless precision with which large numbers of mouldings are turned out as smart and ingenious packages for modern products. The stand fits snugly inside the hat, and both are in black Scarab.

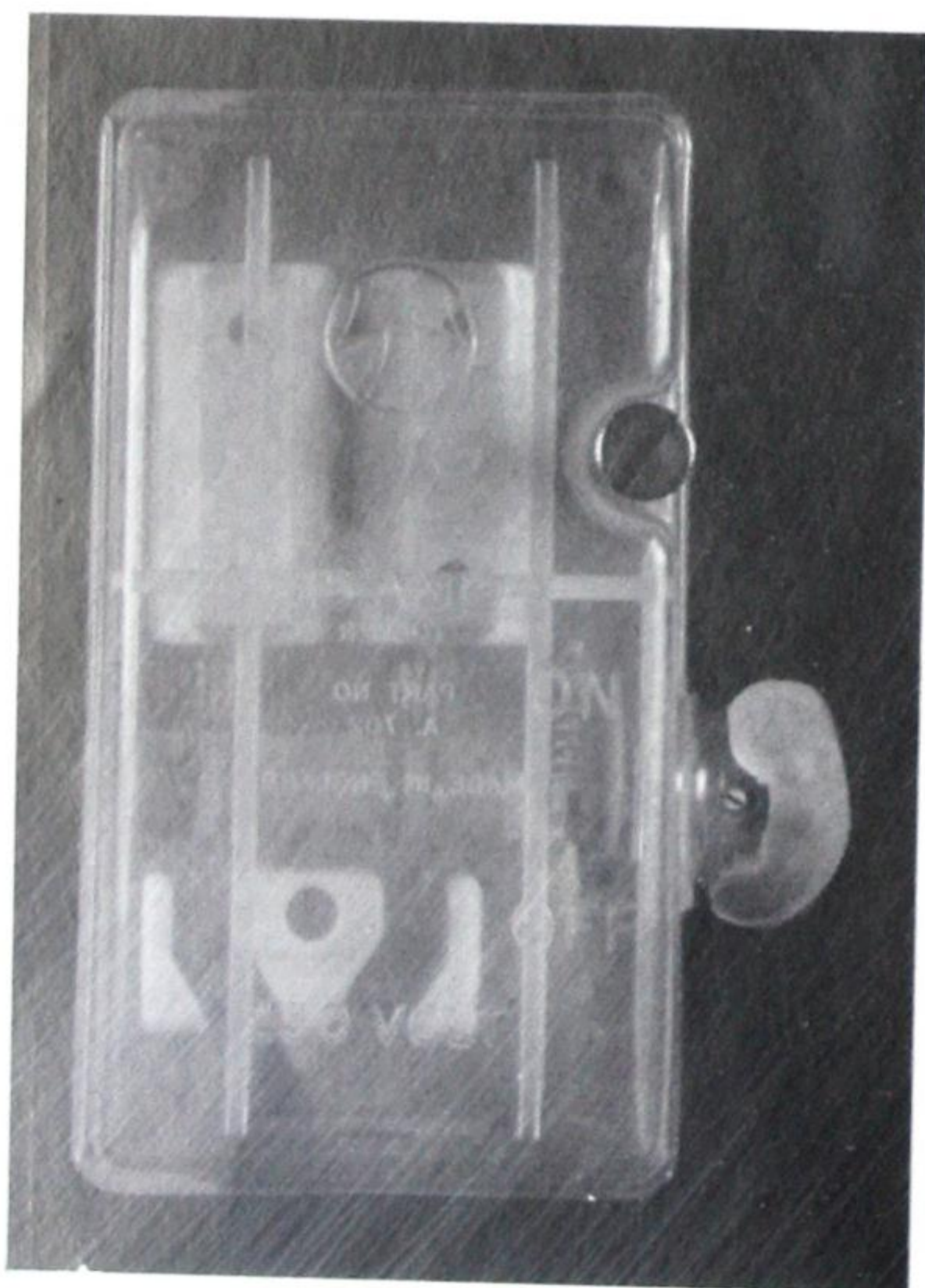


One of the tests of modern electrical engineers is the phenomenon known as tracking, that is arcing of the electric current from one terminal to another across the surface of the insulator, thereby destroying the latter and causing an electrical breakdown. B.I.P. have developed a special mould-stuff which makes this tracking impossible.

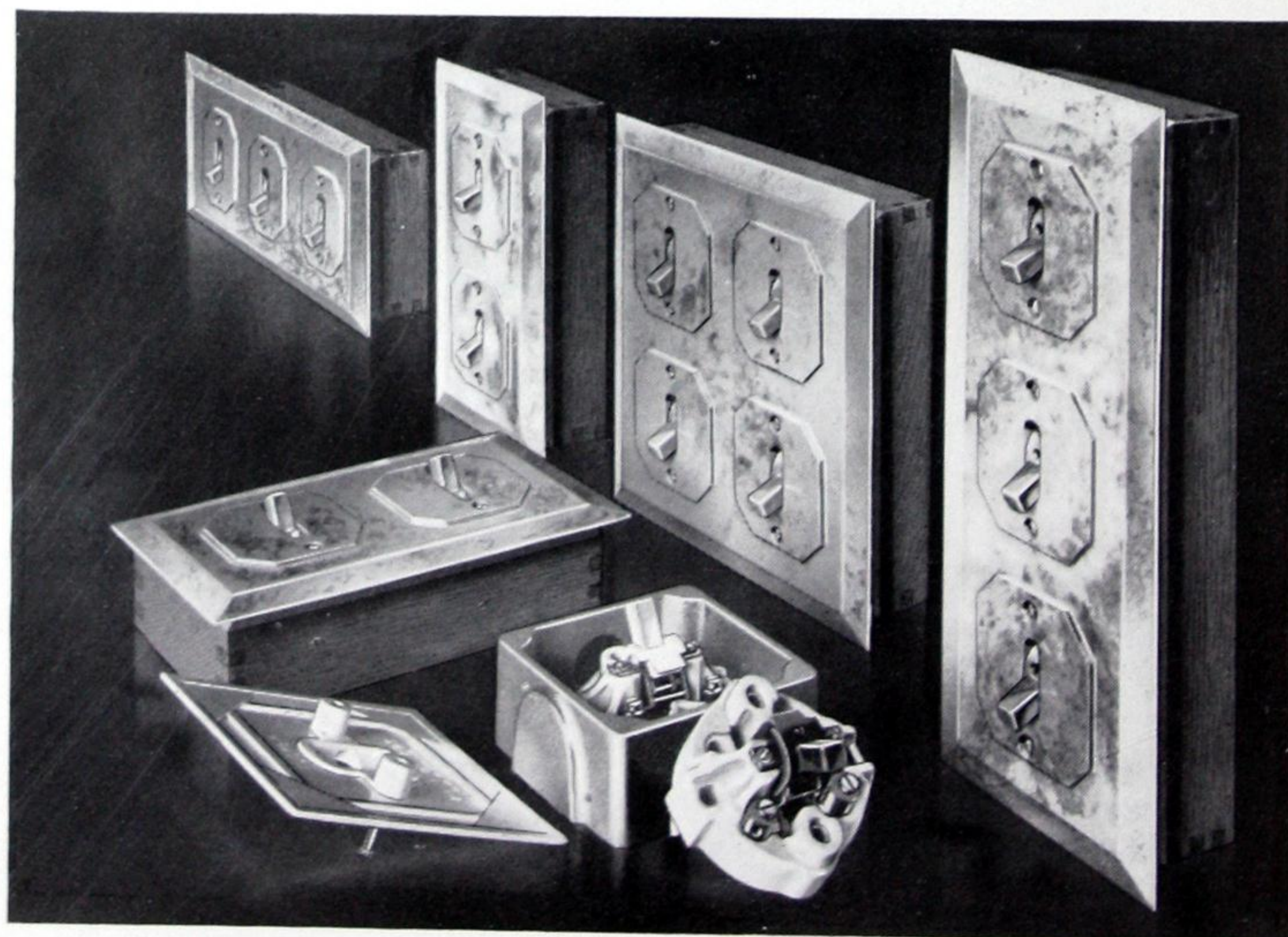
Of these two 230-volt 15-amp. safety sockets that on the left is fitted with a shield moulded from Scarab and has been tested ten times over at 300 volts 18-amps. That on the right is moulded from an ordinary phenolic insulating material and after only four tests the tracking is so bad that the metal contactor has burnt and fused and there is a black deposit covering the surface.

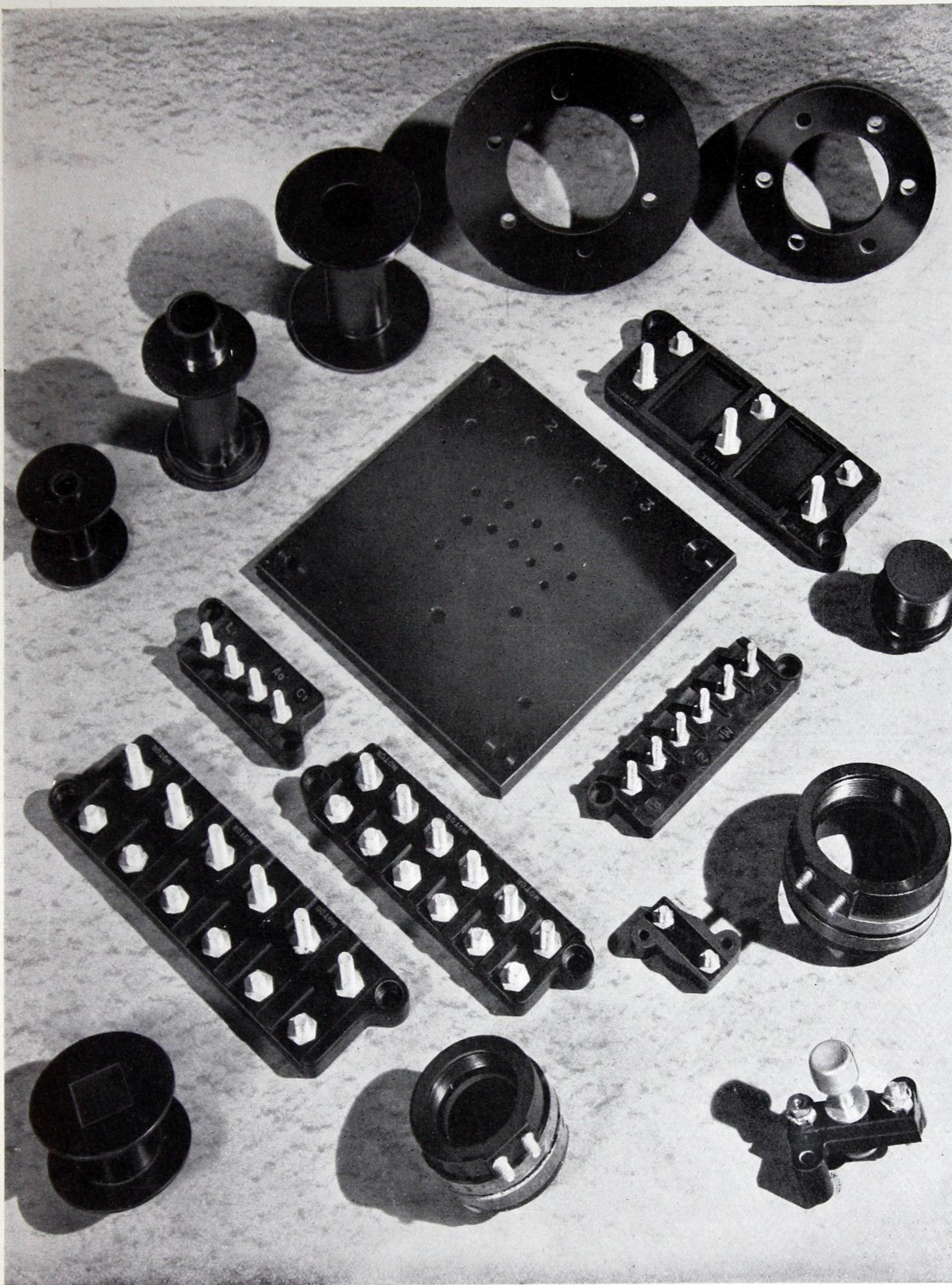
Electrical engineers testify to the reliability of Scarab in eliminating the risk of tracking and the above test vividly illustrates the justness of their claim.

Left, the cover of a fuse box moulded from Beetle Transparent. Covers for delicate electrical apparatus are an important application of Transparent mouldstuffs



as it is often desirable to see just what is going on inside without disturbing the apparatus. The moulded plates shown to the right, while providing effective insulation, remain clean, and untarnished. Accessory makers can now offer them in a wide range of shades to harmonise with every colour scheme.



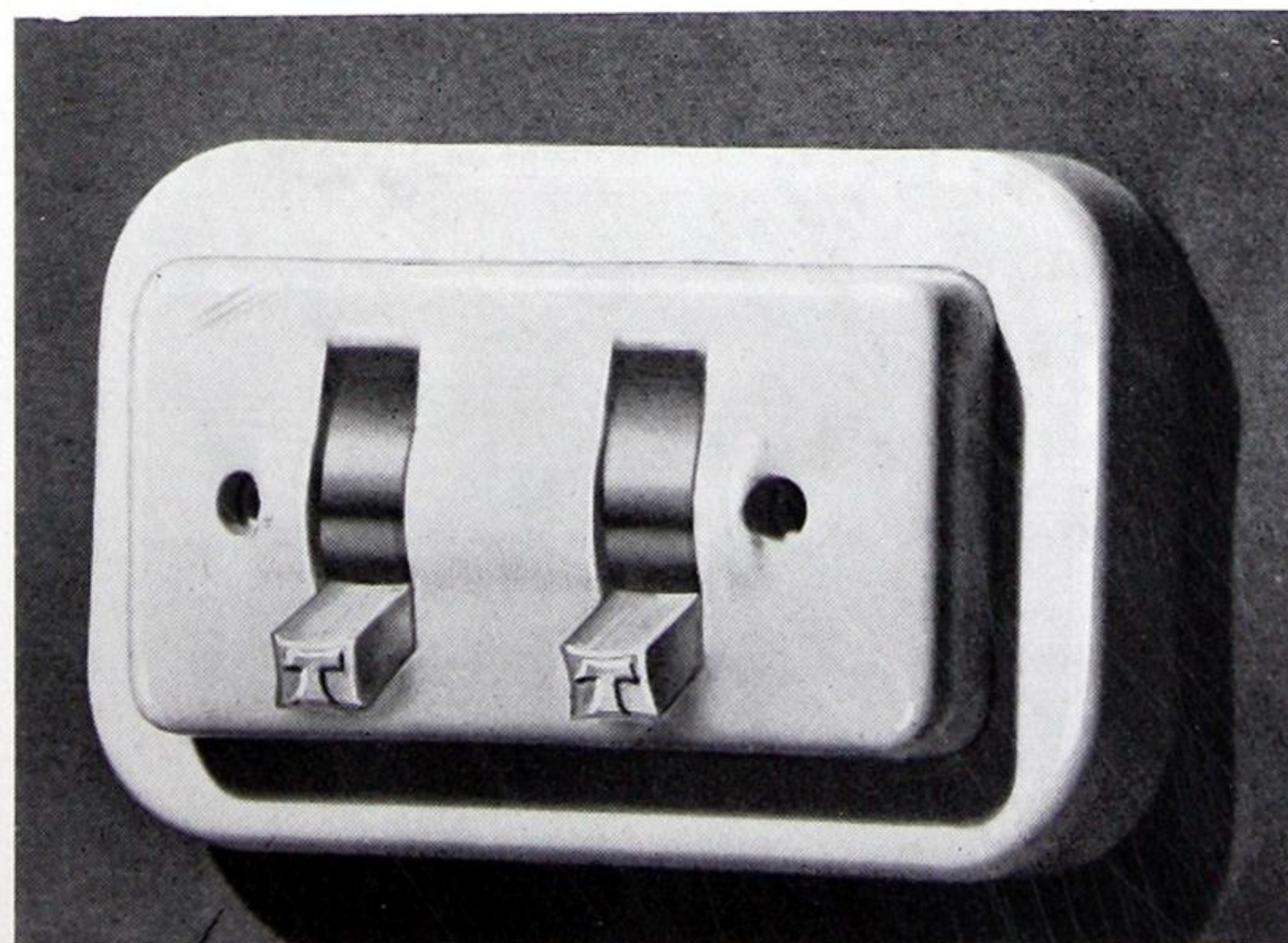
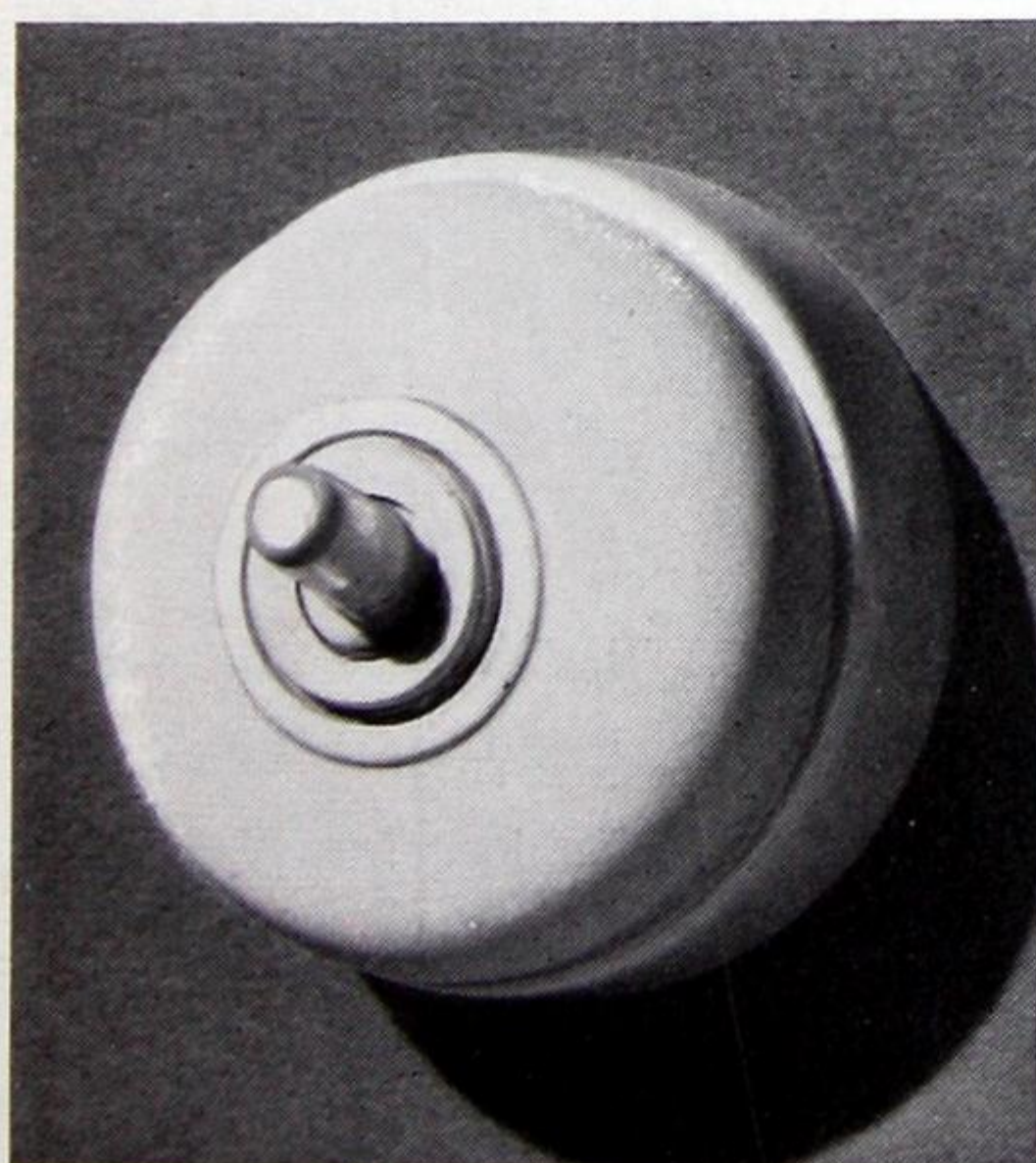


The unique insulating properties of Scarab mouldings are well recognised by electrical engineers. Even when metal inserts are moulded integrally with the piece they will not develop "tracking." These properties remain unimpaired by constant use and the passage of the years.

For important but obscure positions in warehouse and factory black or brown fittings are used, but in homes and offices white or cream are better—they show up dust and dirt and you cannot soil your fingers unawares.

B.I.P. maintains a well-equipped physical laboratory with apparatus for conducting electrical testing. Details of dielectrical properties of B.I.P. mouldstuffs are given in the table at the end of the booklet.

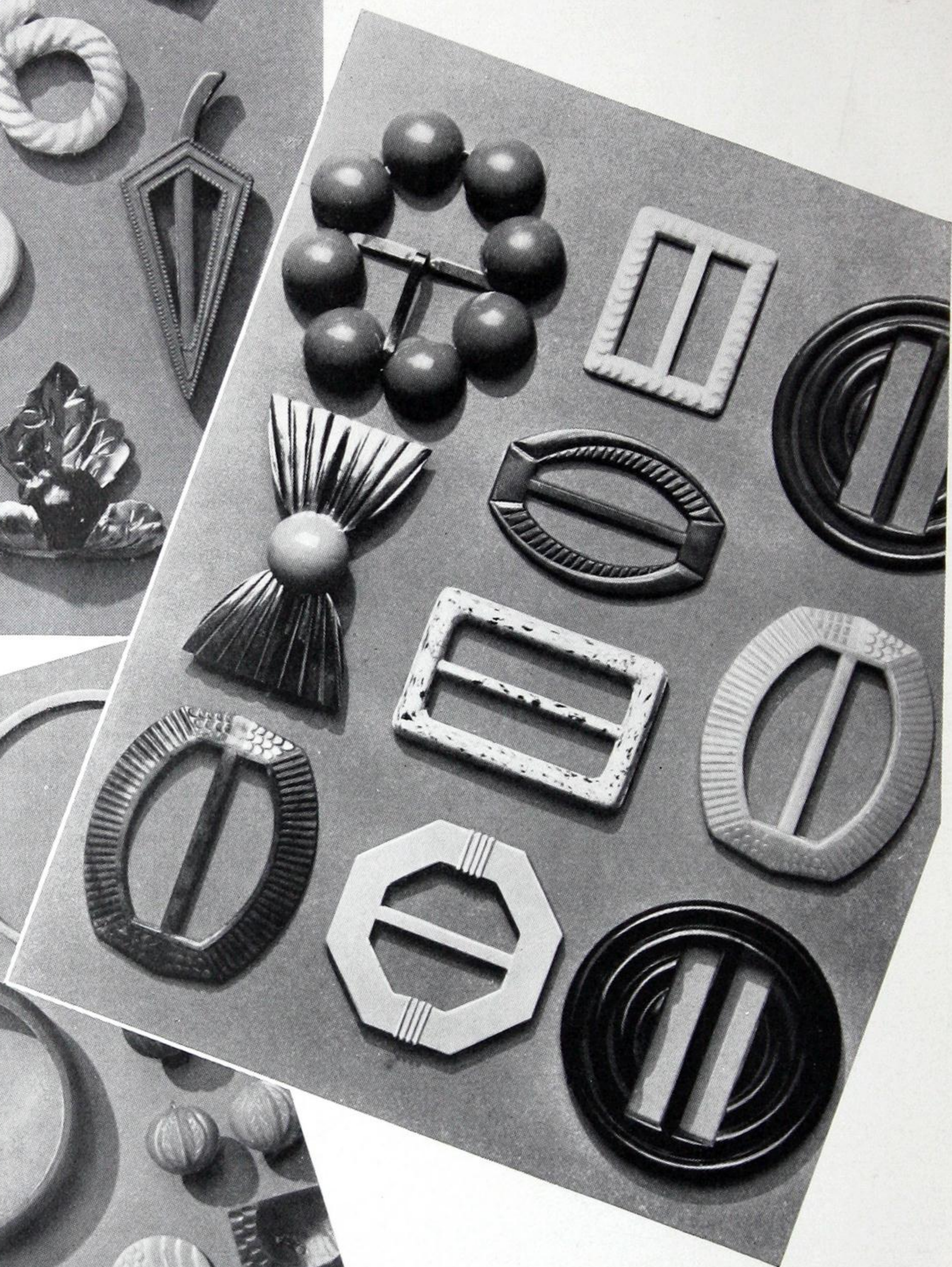
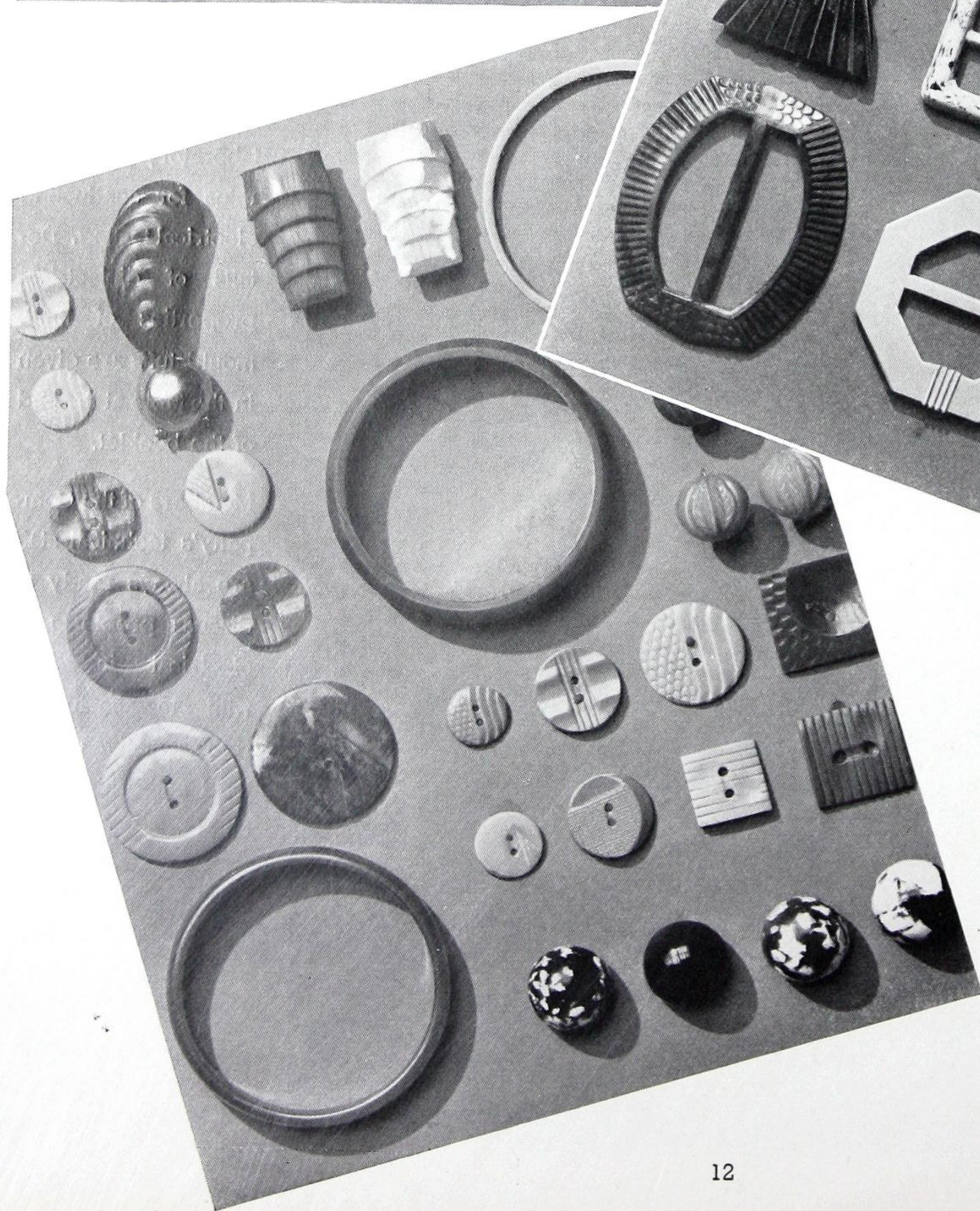
Members of the Company's technical staff are always ready to discuss problems of electrical insulation with manufacturers, representatives of local authorities, and others.





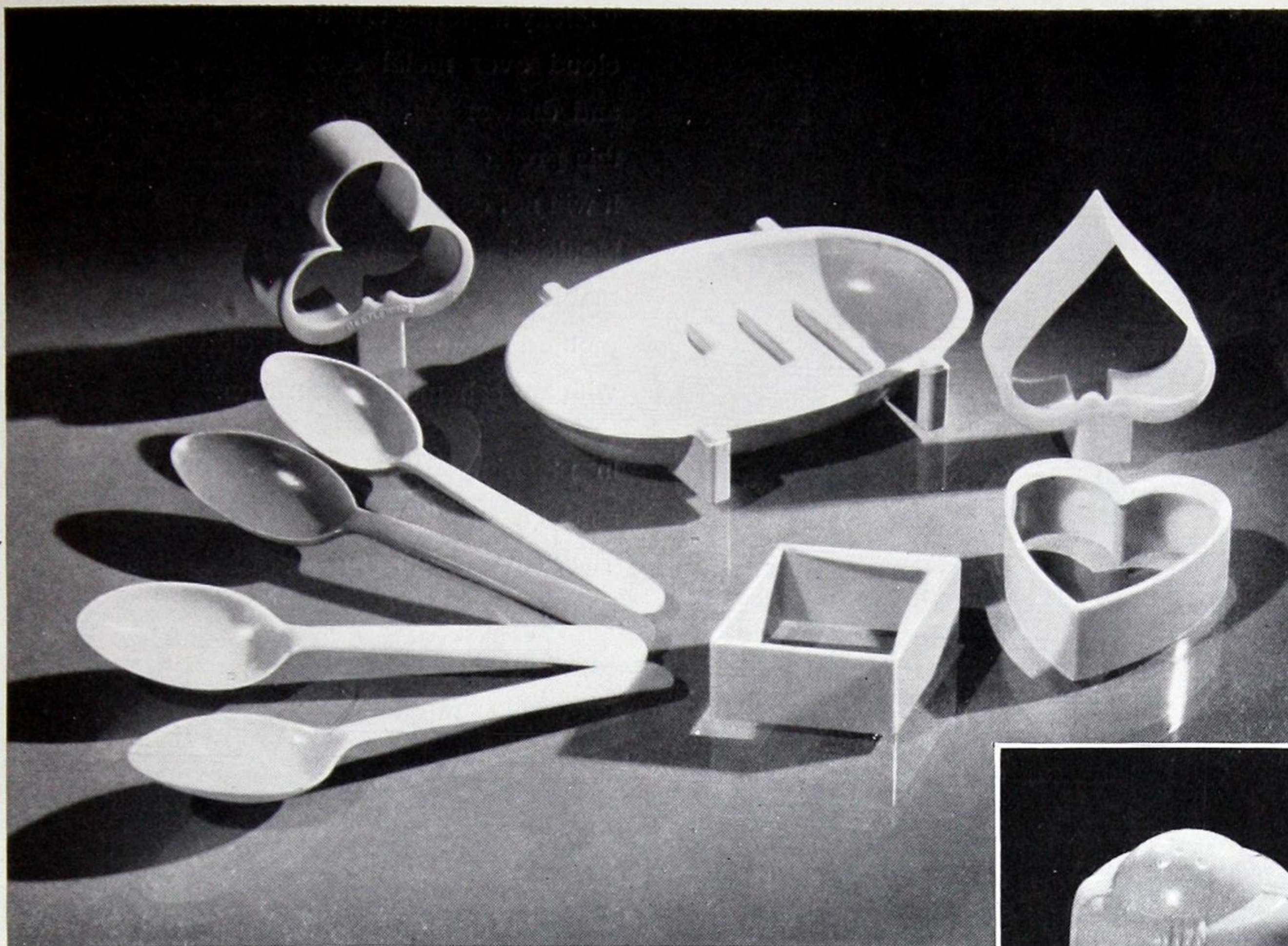
In these days of bolder and more colourful adornment it is essential that bangles, clasps and ear-rings should be in harmony.

Beetle—with its brilliant and permanent colours—is an ideal material for bangles, brooches, slides and buckles. A separate set of jewellery for every frock in the wardrobe!



Where would the modern button manufacturer be without Plastics? Synthetic mouldstuffs inspired smart design and bright, harmonious tones of colour unattainable in natural horn or nut.

Many of the designs on this page come from Australia—where they get next season's fashions from London, Paris and New York by radio, and are *not* six months out-of-date as might be expected.



Tableware mouldings in Beetle ! their long sought solution of nursery and picnic problems needs no stressing. But there are neat, non-fragile patterns for many other everyday needs—some shown on this page. On the left, teaspoons and pastry-cutters and a handy soap dish.

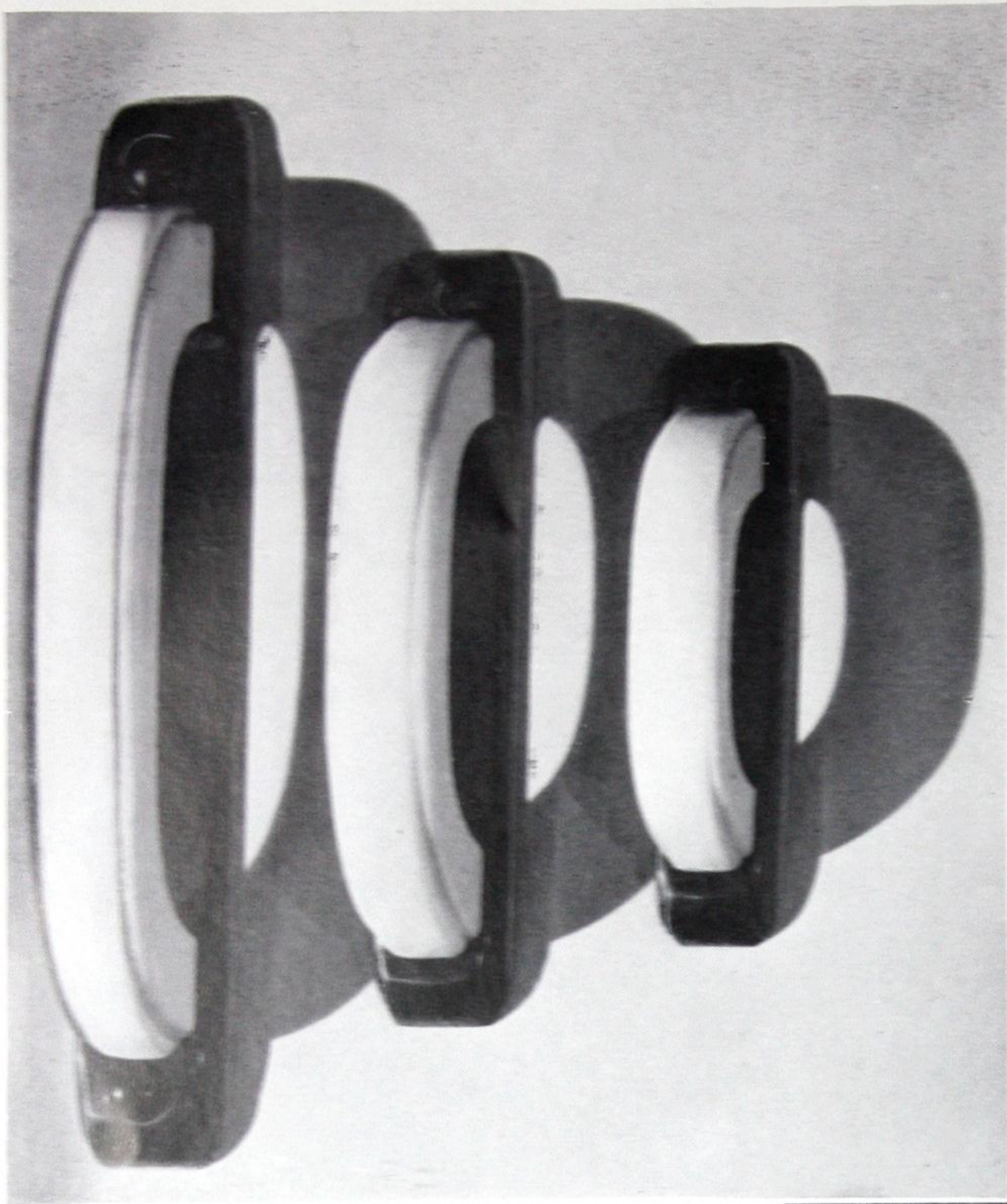
Not least among the merits of Plastics is the release from conventional lines and tedious, ugly shapes afforded by the moulding process. The cruet things and sugar caster to the right are hard to beat for good yet unobtrusive design—so are the child's mug and the grapefruit holder



A wide variety of everyday household things is sold under the registered trade-mark Beetleware by F. W. Woolworth and Co., Ltd. Ask for Beetleware and you are assured of good yet simple patterns of enduring quality.

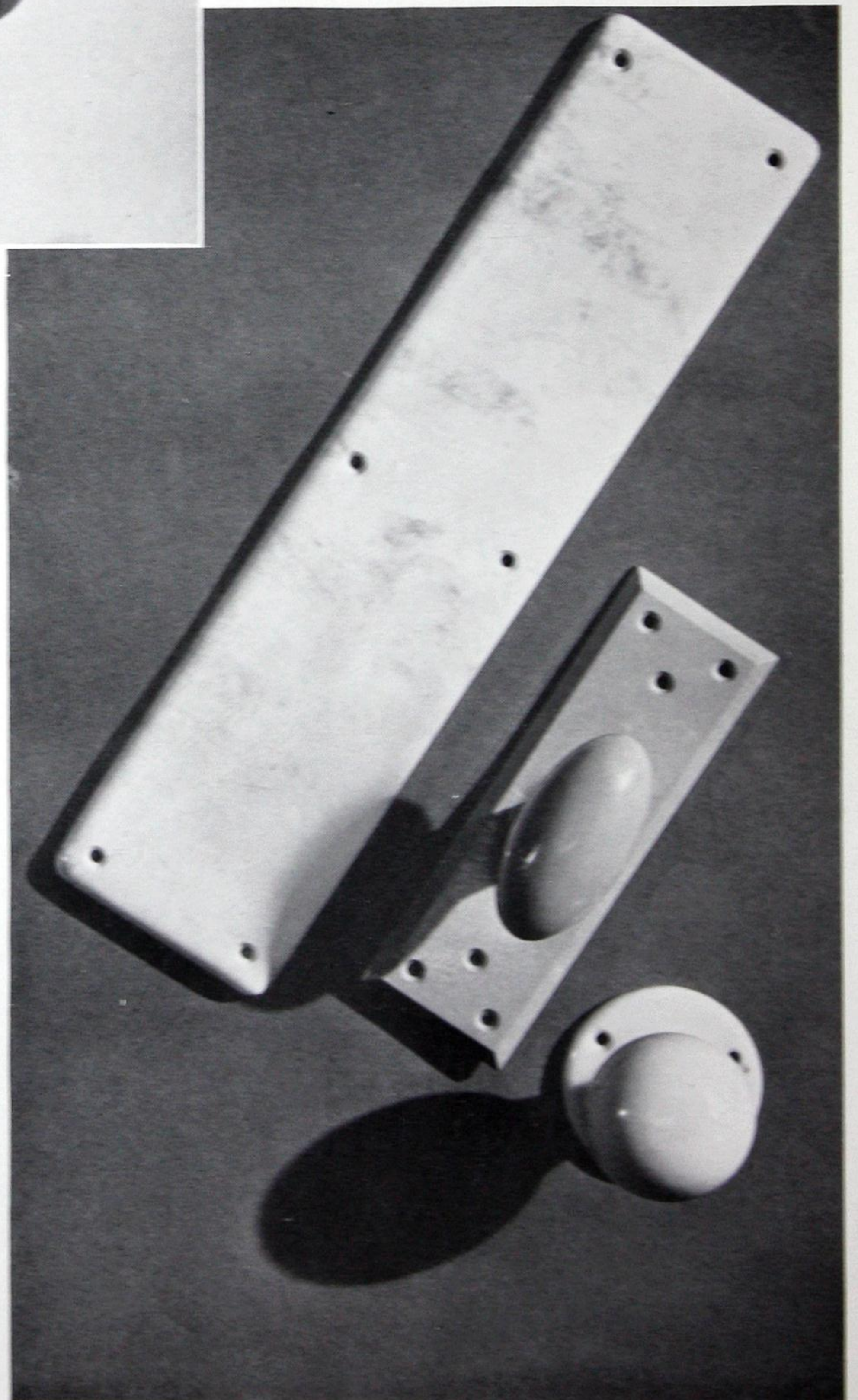
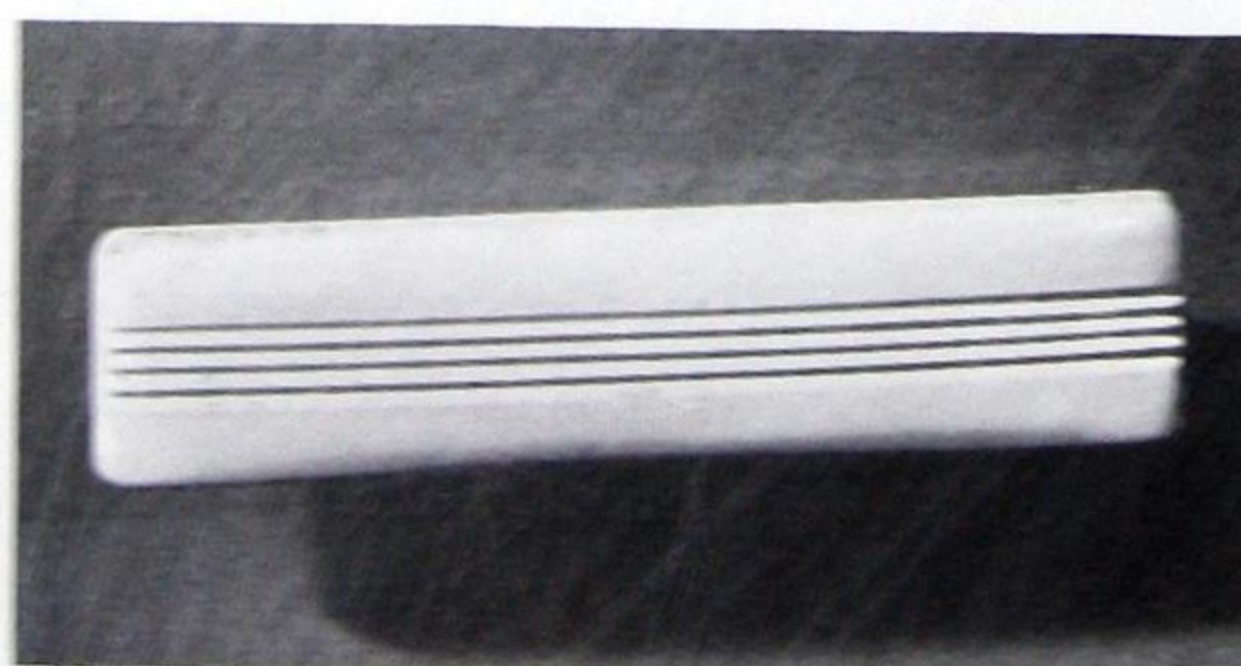
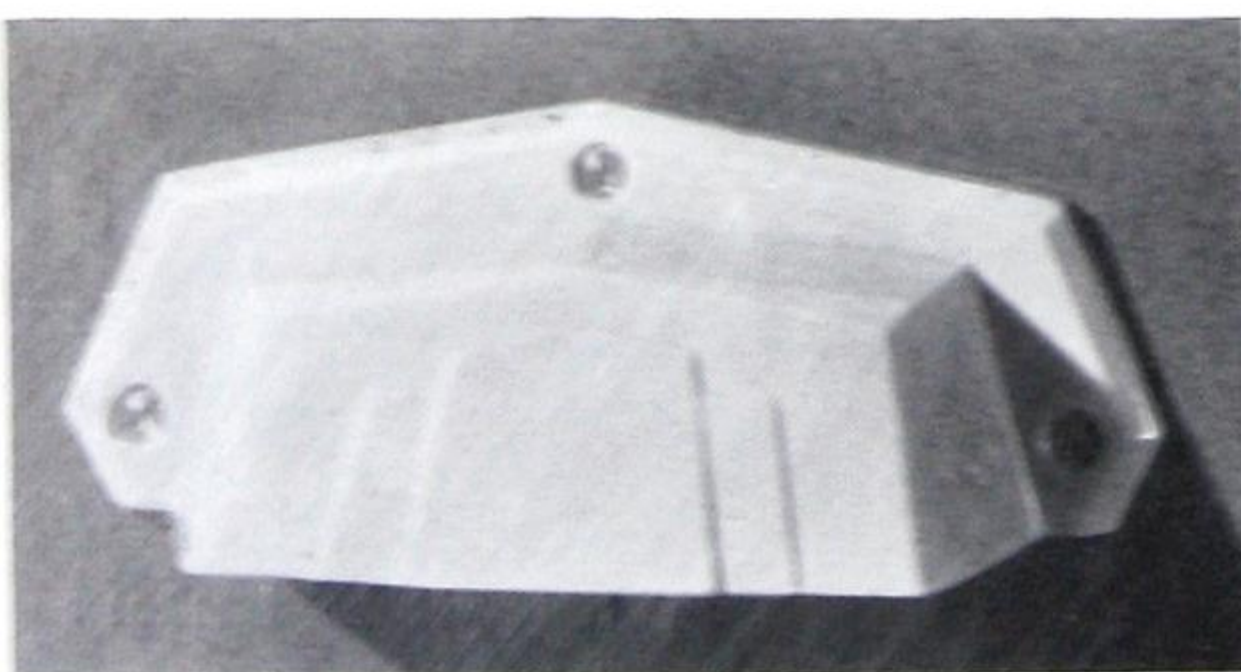
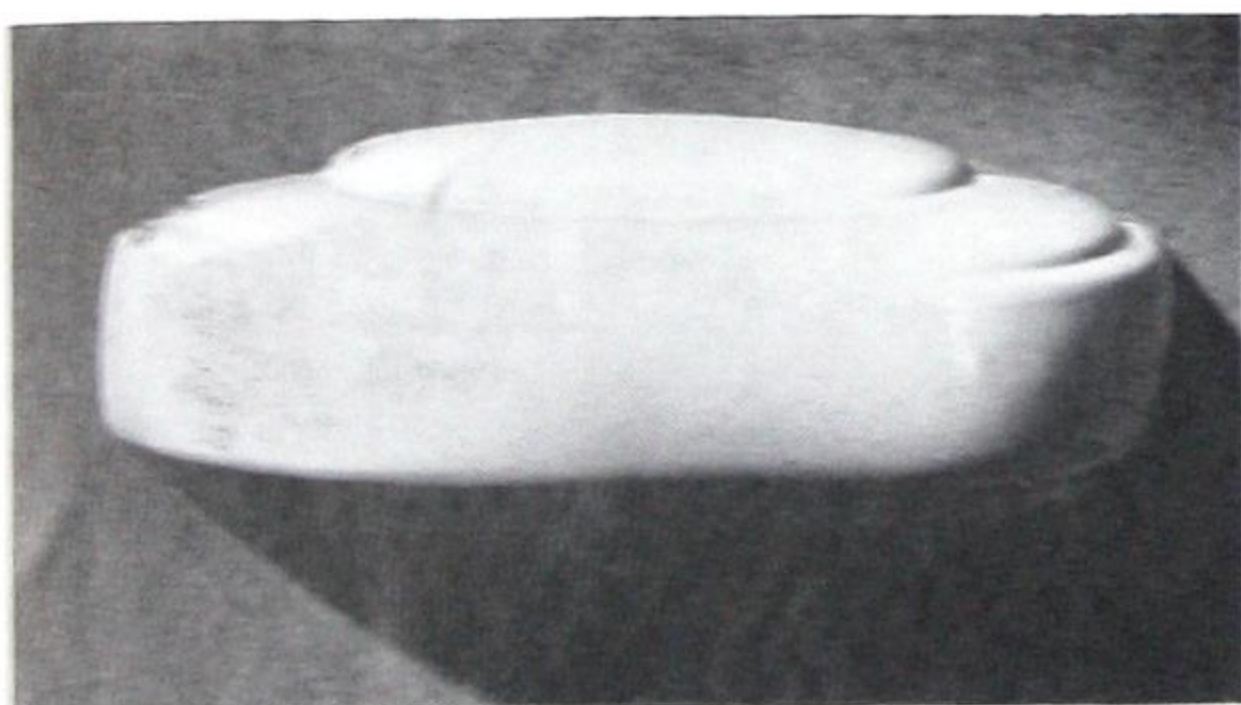


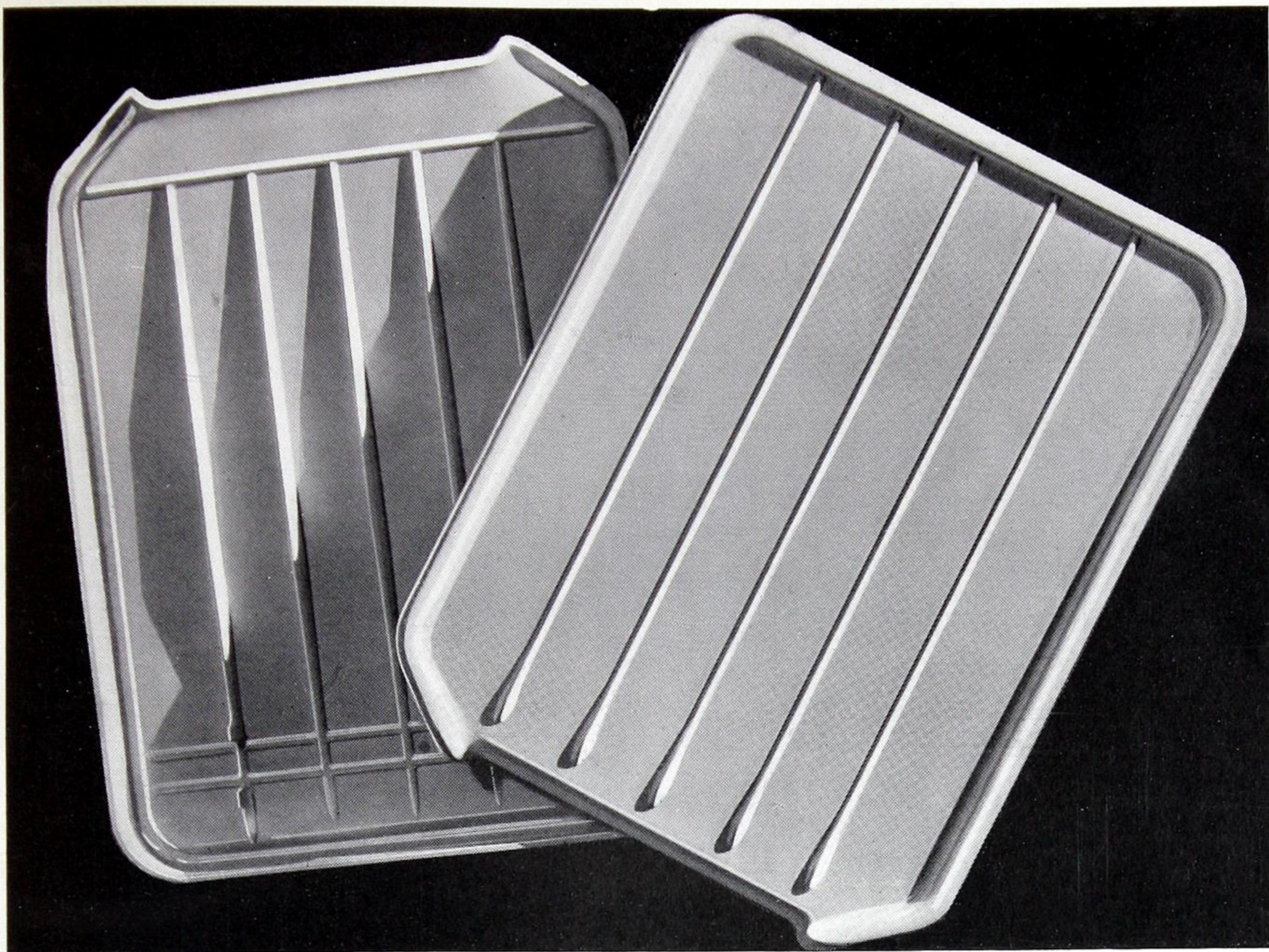
The cup on the left is designed to "nest" so that half-a-dozen can be stacked snugly together in the picnic basket ; result—economy of space and no rattling. Or, just throw them into the back of the car along with vacuum flask and sandwiches—there is a delightful air of informality about a picnic with Beetleware.



"Sticky fingers" and a humid climate quickly cloud over metal door knobs, fingerplates, and drawer handles. Beetle puts an end to this problem and saves household drudgery. It will not corrode and never needs polishing. Moulded fittings are also strong, non-inflammable and colourful—smart pastel shades or mottled colours can be selected to harmonise with any scheme of decoration.

In planning flats, hotels, and private houses modern architects specify moulded fittings. They save labour and add distinction to your home.



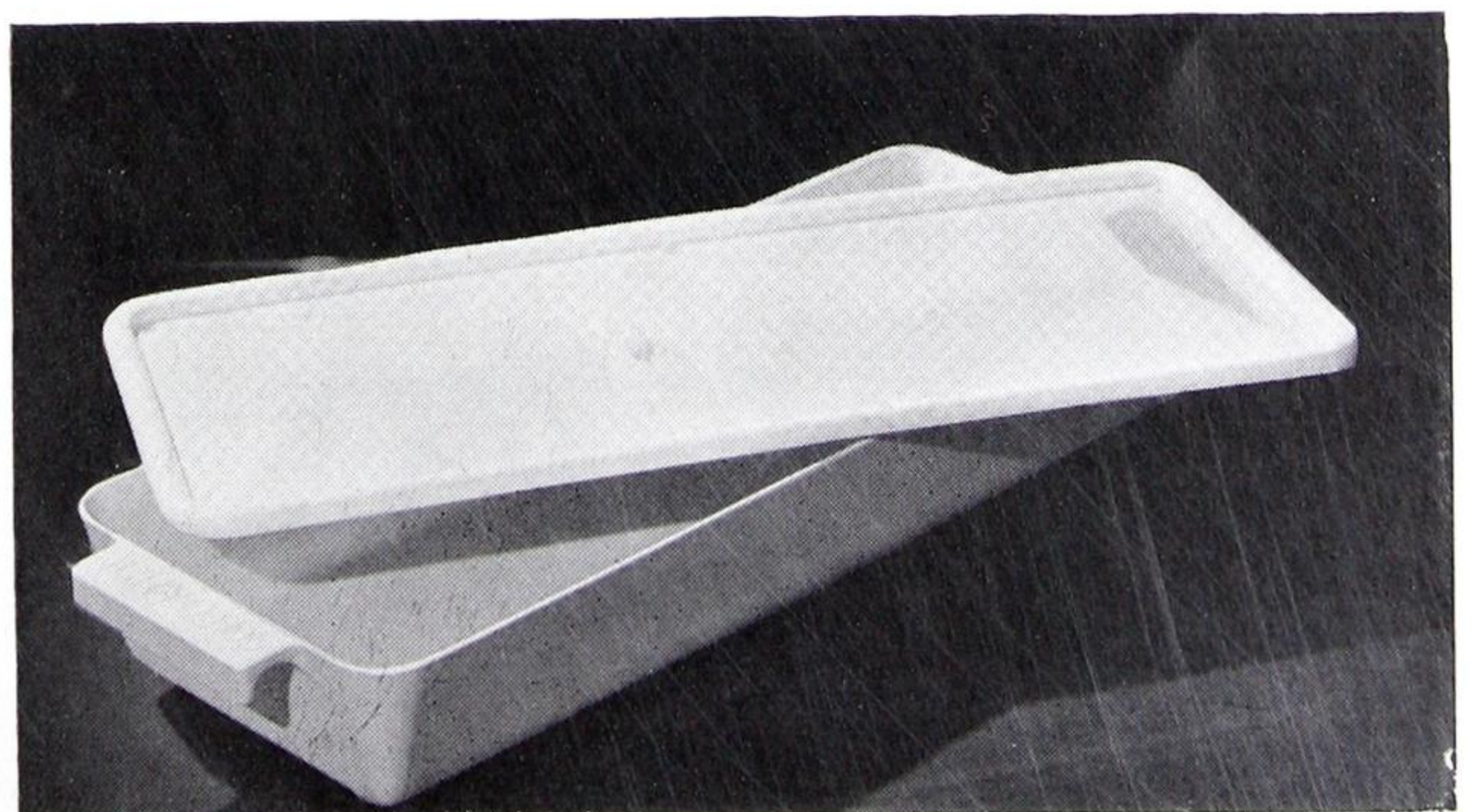


KITCHEN DRAINING BOARDS and trays in White Beetle or pastel shades of Scarab are hygienic, non-absorbent, and easily washed. Up-to-date butchers and provision merchants display their stocks on trays or slabs of Beetleware. They are tasteless, odourless, and do not readily chip or crack like china or enamel.

Of refrigeration, a technical journal has said: "Plastics would seem to have been invented especially for refrigerators, so well do they answer requirements. These synthetic materials have ideal properties; a clean sanitary appearance; a smooth, stain-proof and chip-proof lustre; resistance to moisture, food acids and corrosion; they take intricate shapes economically, and are readily available in the large quantities the industry now requires."



Left—a handwheel and funnels for a water softening plant. Scarab mouldings are unaffected by water, fresh or salt, and other liquids of everyday life. Below—a freezing drawer and lid for a refrigerator.

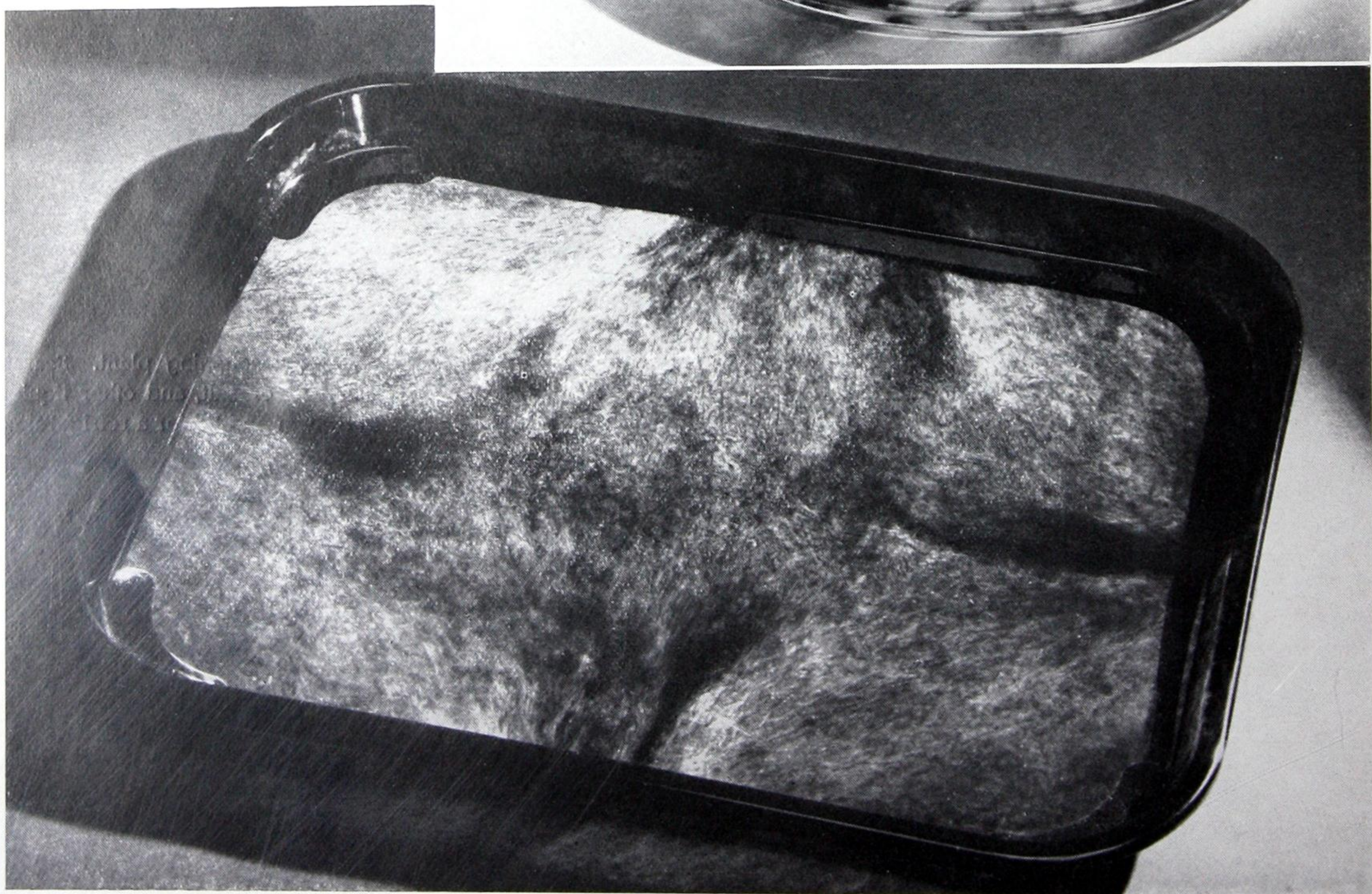
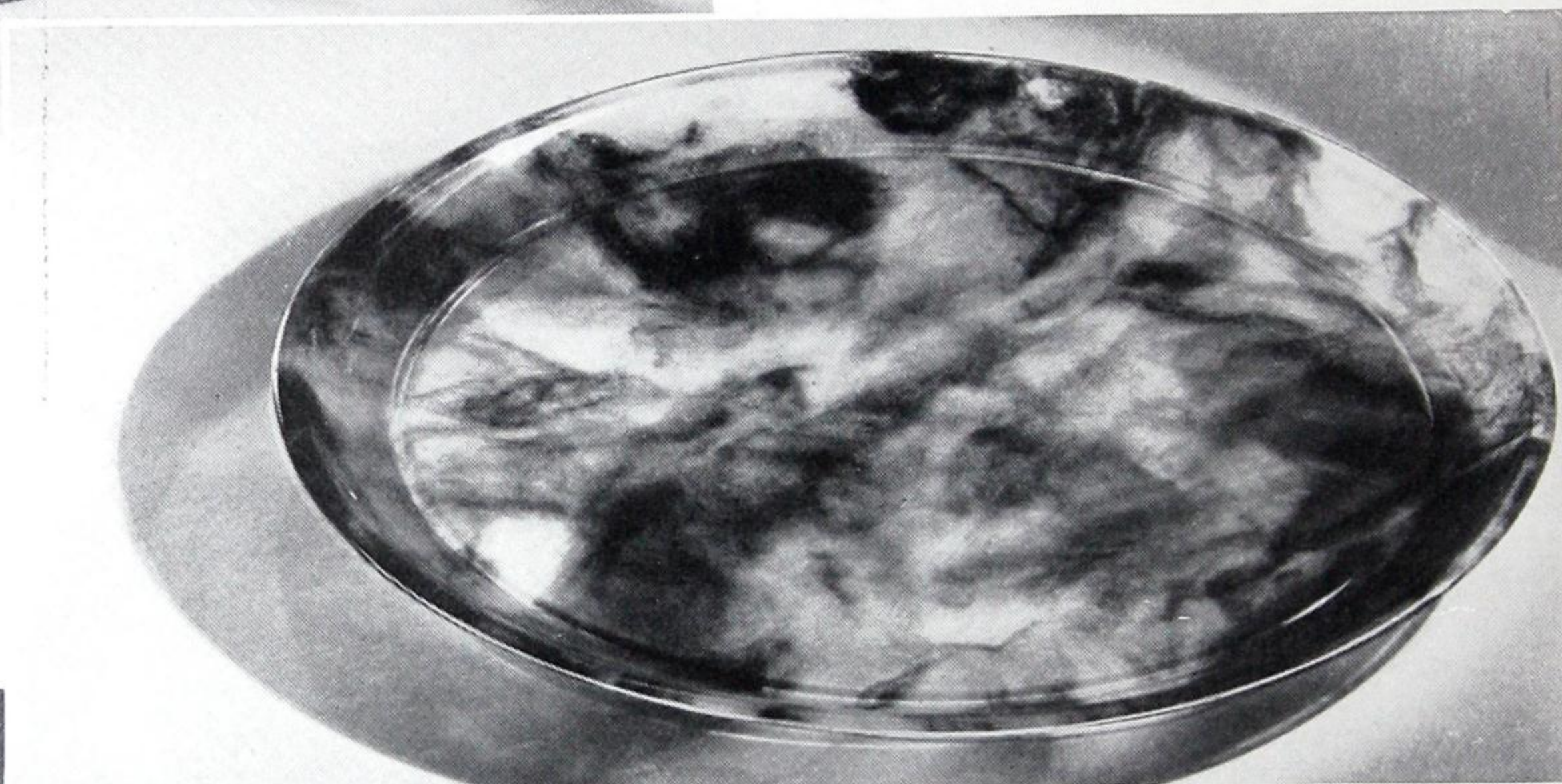


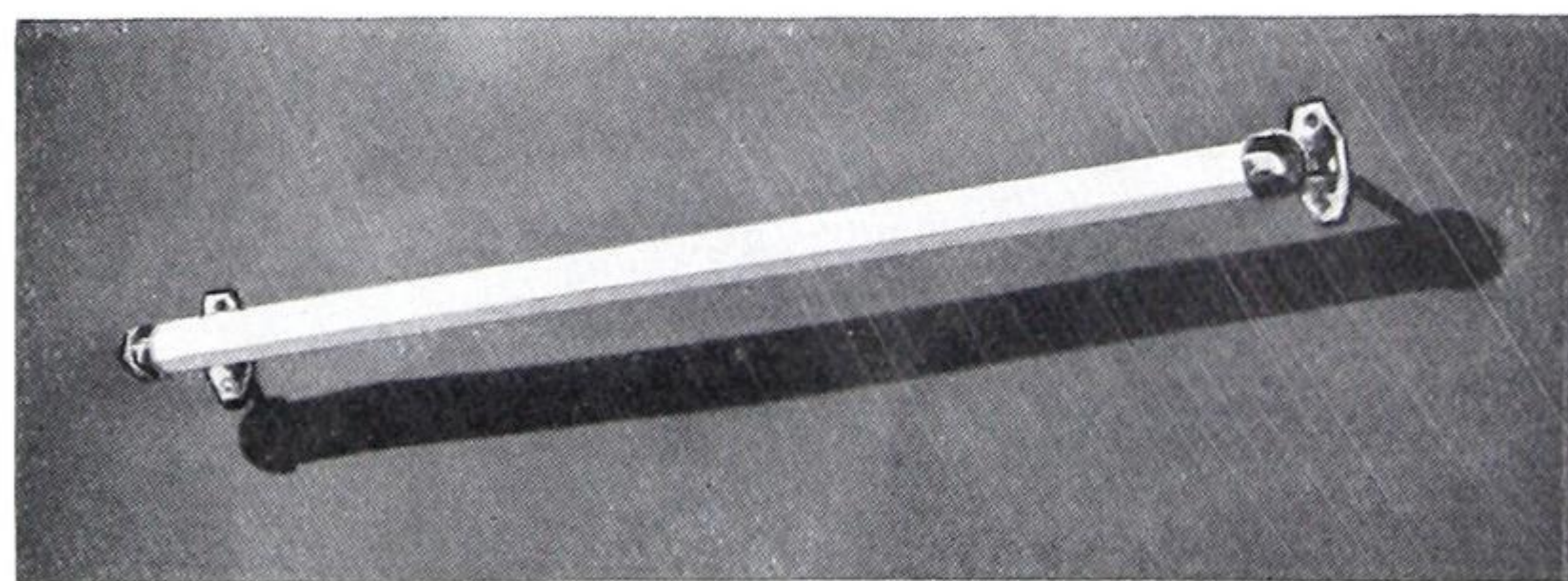
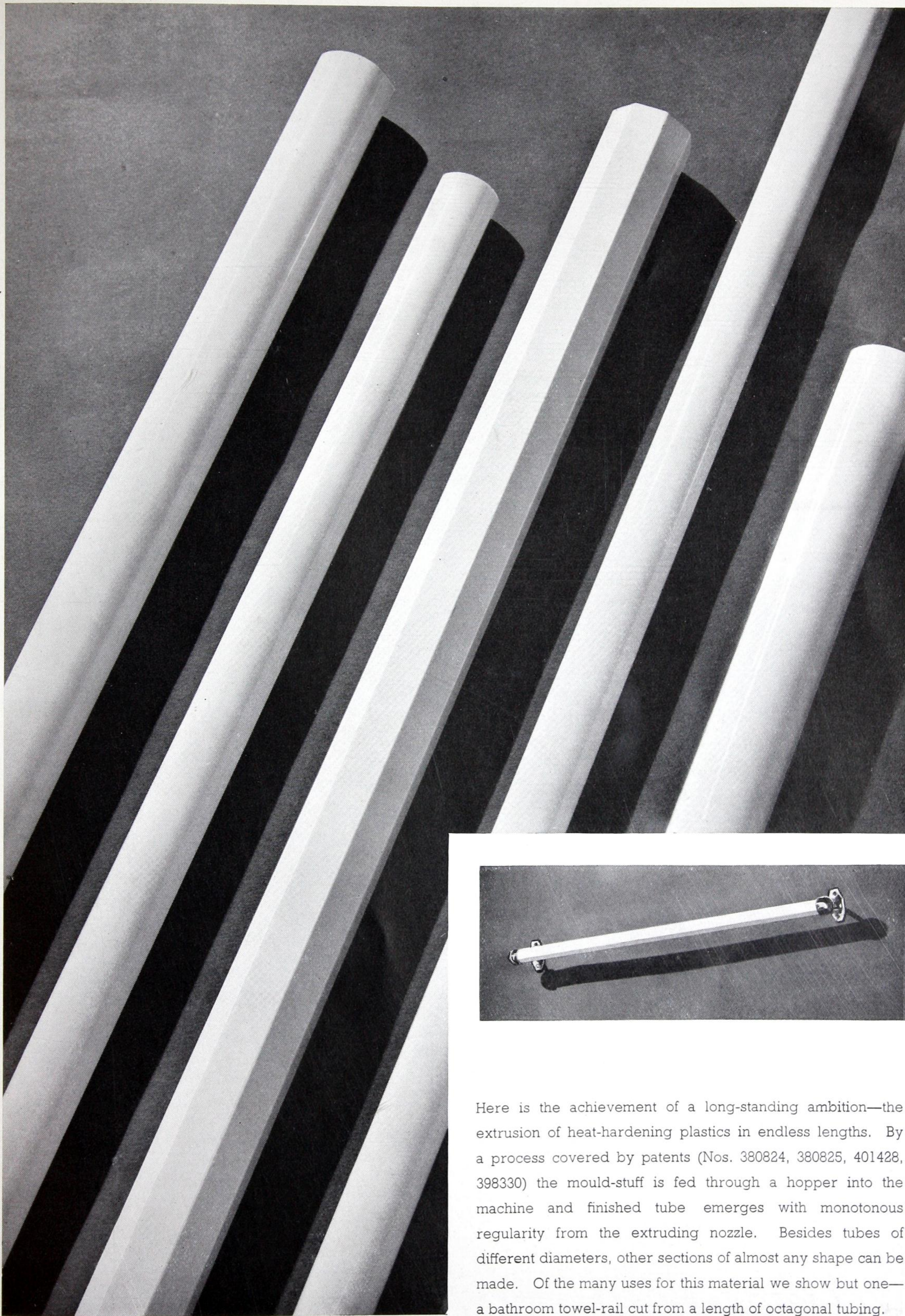


Beetle Transparent—most fascinating of Plastics—glass-clear and limpid as a pool of water on a summer day.

Reclining in the bowl is shown a brightly-coloured doll—the first one made in non-inflammable thermo-setting plastics. With these gay Scarab units children can build an ever-changing family. There are Scarab bricks, too, from which to build a mansion to your own design—with sloping roof and doors and windows all to scale.

Beetle Transparent is available also in delicate colours; of the trays shown here the tortoiseshell is almost indistinguishable from the natural shell, whilst the other has a richly-grained effect not found in any natural substance.





Here is the achievement of a long-standing ambition—the extrusion of heat-hardening plastics in endless lengths. By a process covered by patents (Nos. 380824, 380825, 401428, 398330) the mould-stuff is fed through a hopper into the machine and finished tube emerges with monotonous regularity from the extruding nozzle. Besides tubes of different diameters, other sections of almost any shape can be made. Of the many uses for this material we show but one—a bathroom towel-rail cut from a length of octagonal tubing.

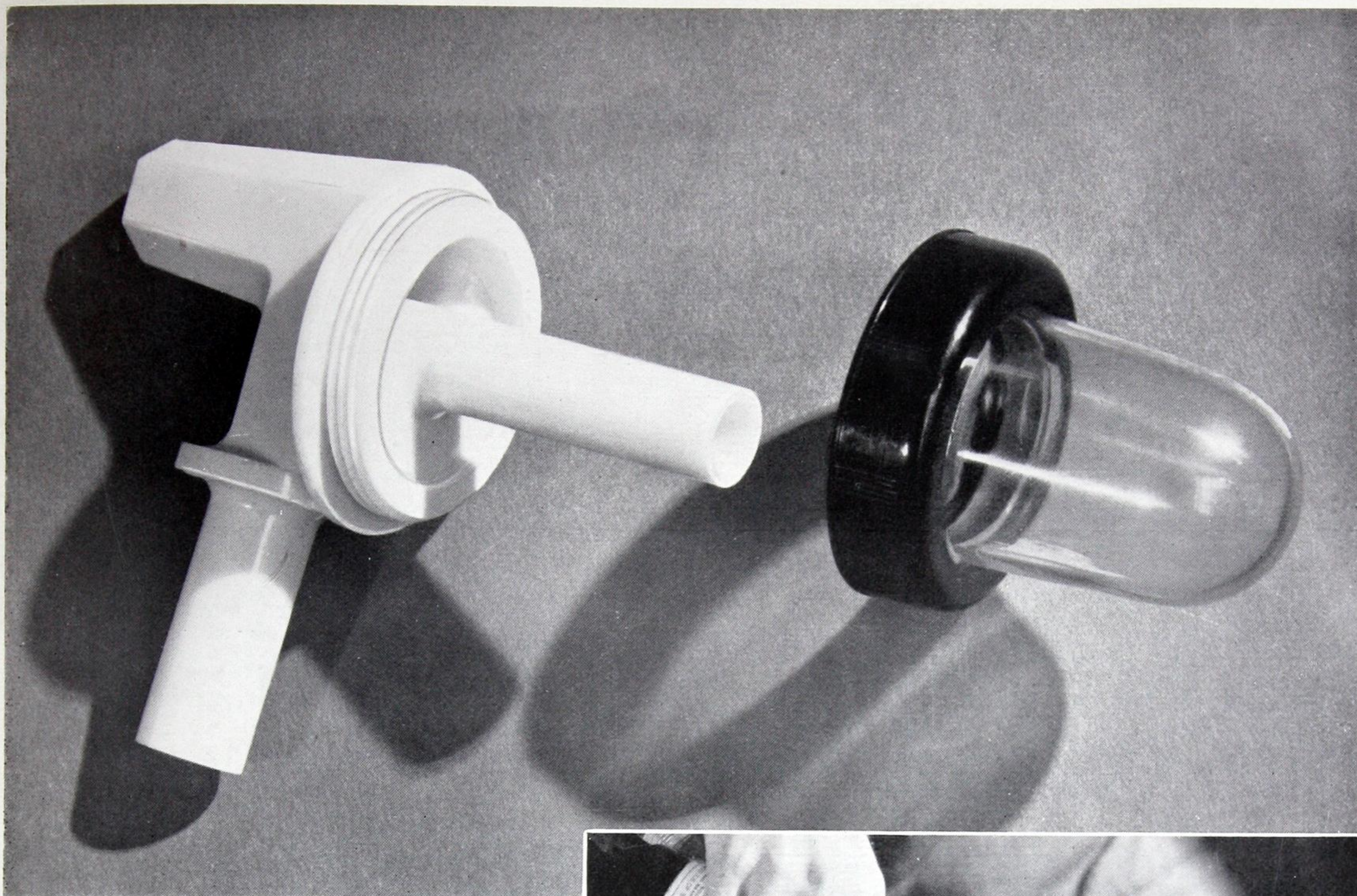


High summer ! . . . shimmering heat haze under a blue sky . . . the striped awning just fluttering over the tavern door . . . inside, a long lager, a ripe cider, or what you will.

To us, the Scarab tankards assure a cool drink and a cool touch—and if our thirst were less it would stay cool *longer*. (All B.I.P. mould-stuffs possess excellent heat insulation properties).

To mine host, they last far longer than glass or china. And the table? In Chrome and Scarab, it needs no polishing, will not chip or splinter, is not stained by spilt liquids.

Inset, a table lamp for after dusk. The base, moulded. The shade, cut from Beetle laminated sheet.

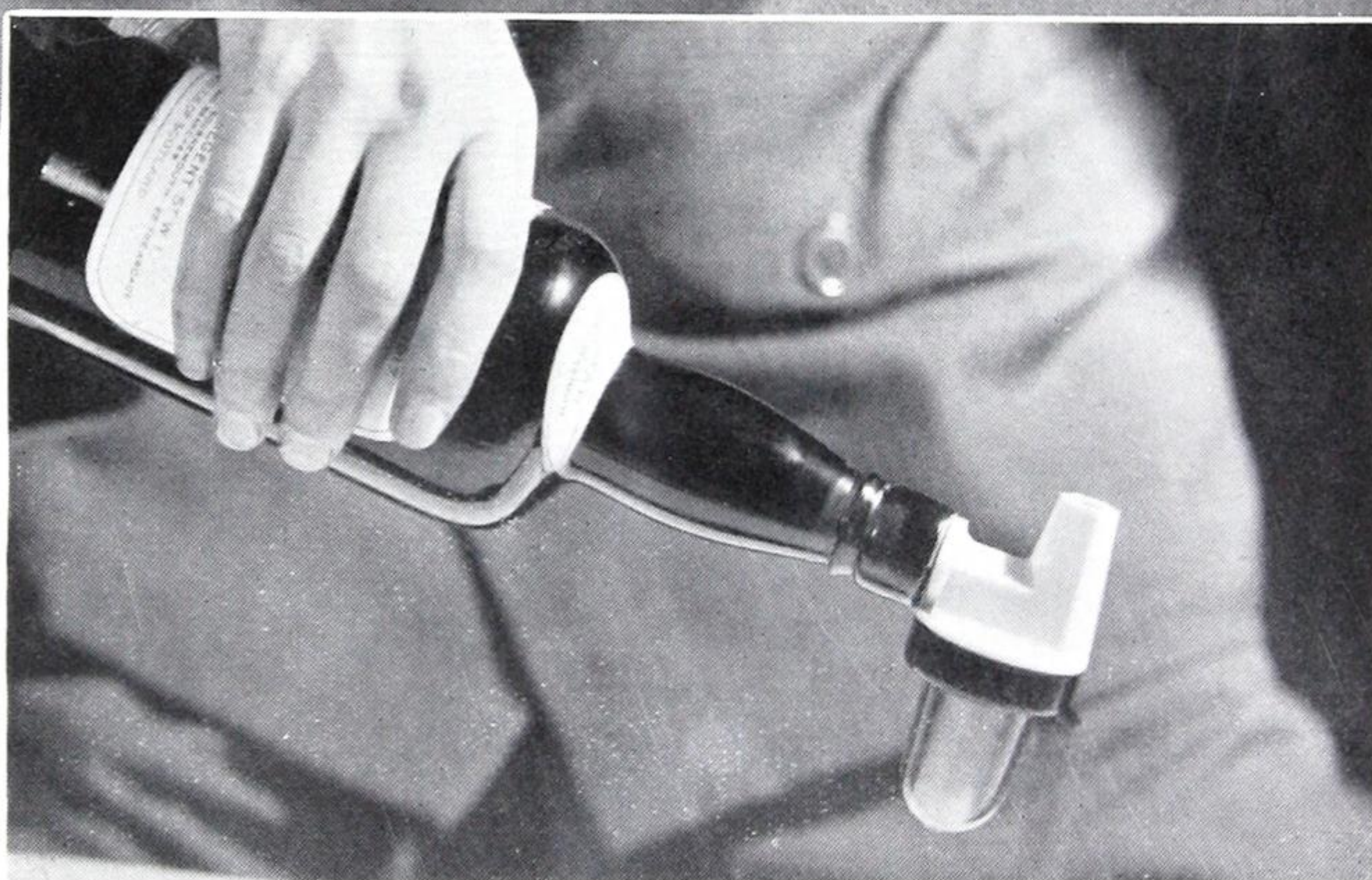


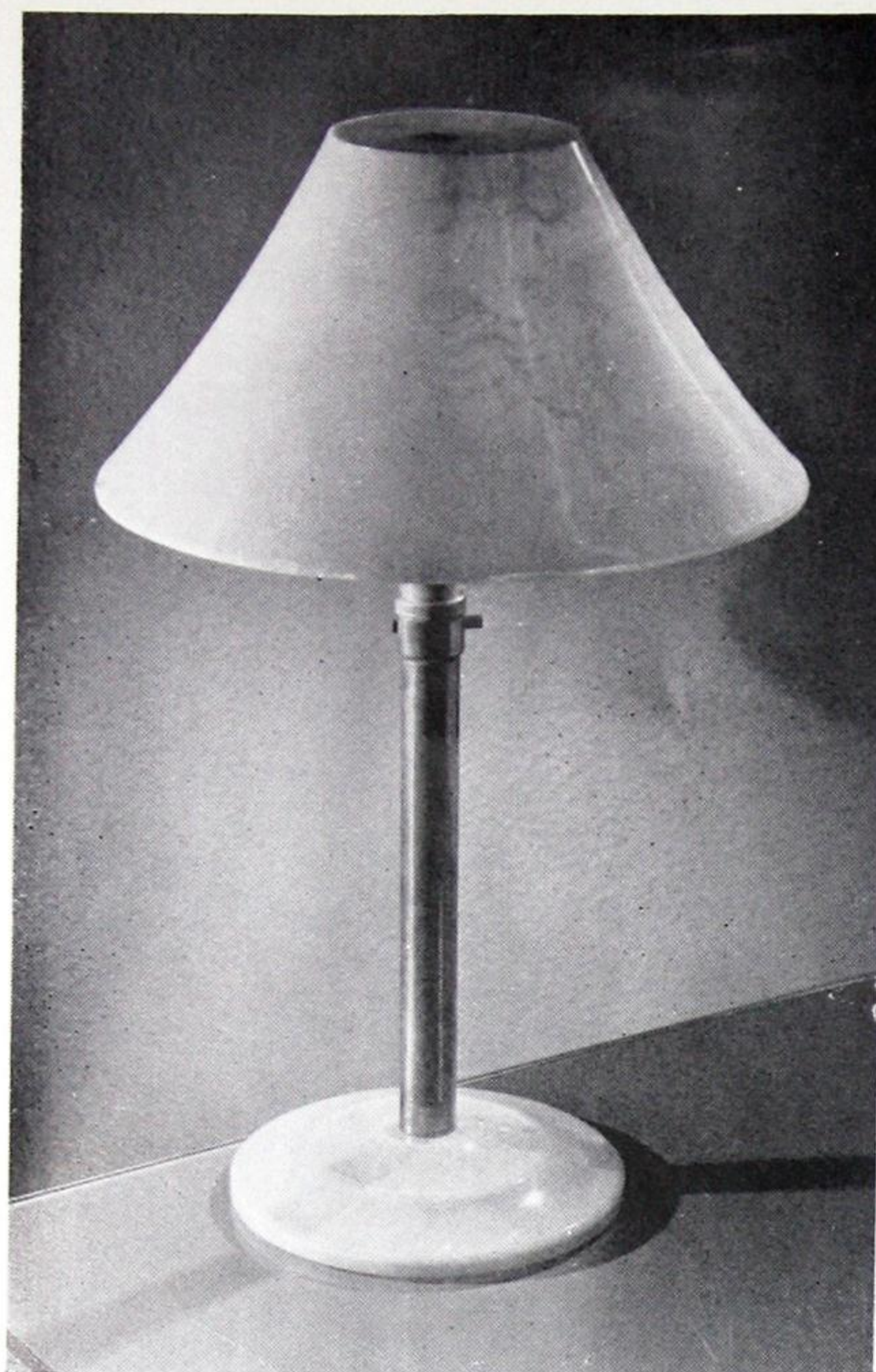
This is the ULTIMAT patent automatic whisky measure which won the "British Plastics" Design Competition.

It is a clever piece of moulding and, incidentally, uses three different plastics—Scarab for the screw ring containing the measure which is in Beetle Transparent; Opaque Beetle for the rather complicated tubed stopper. Unaffected by alcohol, it is as hygienic as it looks—with a few turns of the ring the measure and stopper are separated and the three parts can be easily and perfectly cleaned. And of course there is no risk of tarnishing, inside or out.

The two pictures at the right show the self-measuring action. The upper picture shows the measure being filled by tilting the bottle and the lower how the correct amount is transferred to the glass simply by turning the bottle around in the hand.

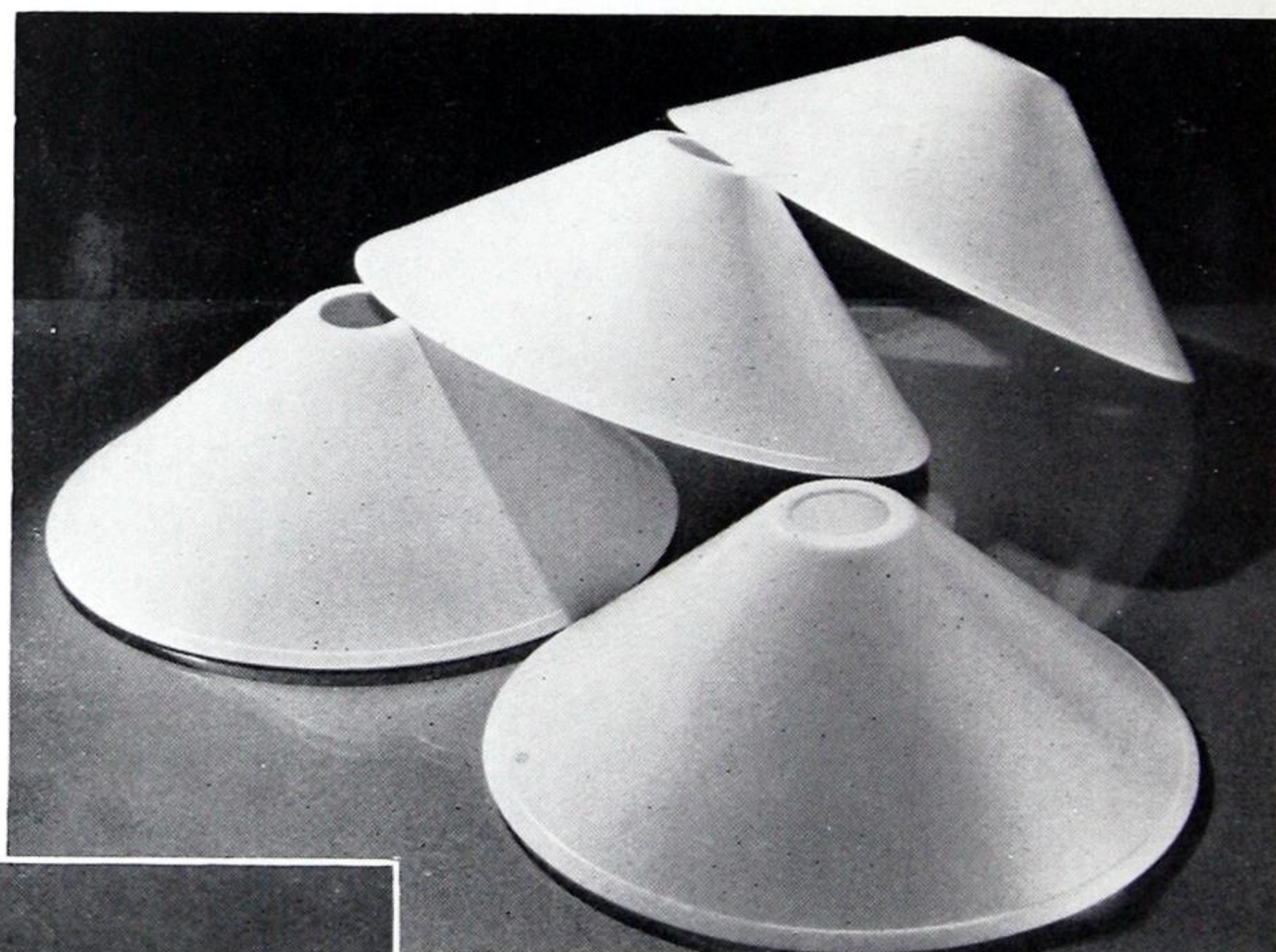
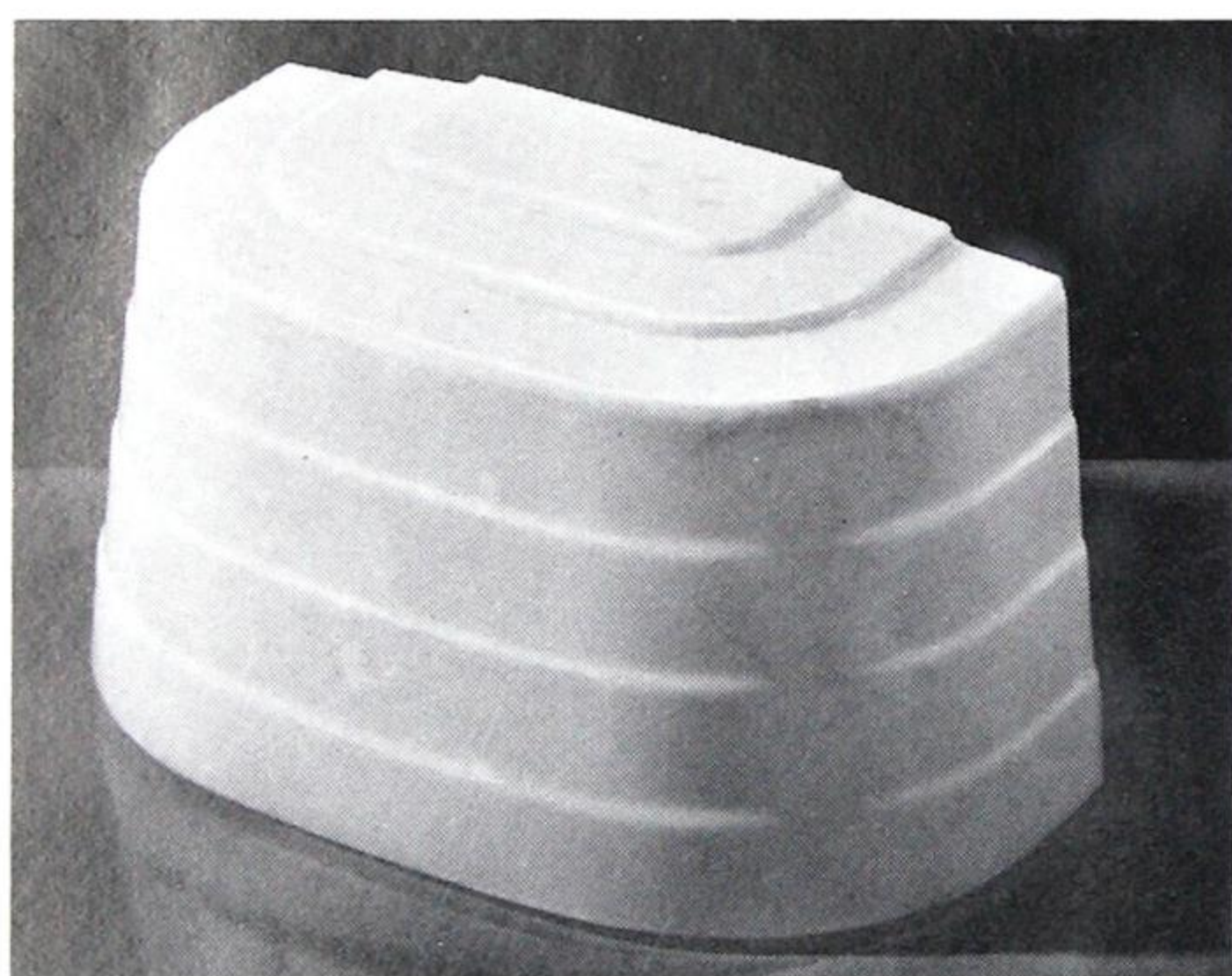
Incidentally, the inclusion of three narrow tubes, running in three directions, and a screw thread in a single piece posed a pretty problem in moulding—solved by B.I.P. designers.





On the left—a simple and effective desk or reading lamp. On the right—another, of more orthodox shape. The shade and base of both lamps designed and made in Beetle.

More and more people are realising the advantage of a bed-head light (below left) in avoiding eye-strain — and tennis elbow! Colours to harmonise with any scheme are obtainable.



The plain white conical shades for the office, the work-bench, etc. (above), and the miscellaneous shades on the left give a good all-round illumination in addition to the concentrated beam.

The even diffusion and high degree of transmission given by its translucent colours make Beetle the ideal material for modern diffused and indirect lighting.

**PHYSICAL PROPERTIES OF MOULDINGS MADE FROM
BEEBLE, BEEBLE TRANSPARENT, SCARAB AND POLLOPAS**

TEST	BEEBLE	BEEBLE TRANSPARENT	POLLOPAS	SCARAB
Specific gravity	1.49—1.63	1.425	1.50—1.60	1.45—1.60
Tensile strength in lb. per sq. in. cross-section	8,000—10,500	7,000—8,000	8,000—10,500	9,000—11,000
Ditto in kgm. per sq. cm.	560—730	490—560	560—730	630—760
Cross-breaking strength in lb. per sq. in.	13,000—16,000	13,000—16,000	14,000—17,000	13,000—16,000
Ditto in kgm. per sq. cm.	915—1,130	915—1,130	985—1,200	915—1,130
Impact strength on Charpy notched-bar test				
In kg. cm. per cm. ²	1.80—2.20	1.8—2.0	1.90—2.30	1.80—2.20
In ft. lb. per sq. in.	0.84—1.02	0.84—0.93	0.88—1.07	0.84—1.02
Water absorption				
(B.S.S.488) 24 hours	30 mgm. (0.10%)	135 mgm. (0.45%)	18 mgm. (0.06%)	45 mgm. (0.15%)
7 days	150 mgm. (0.50%)	—	80 mgm. (0.27%)	195 mgm. (0.65%)
Dielectric strength				
(1) At ordinary temperature	17,000 volts per mm. (432 volts per mil)	—	17,000 volts per mm. (432 volts per mil)	17,000 volts per mm. (432 volts per mil)
(2) Temperature of breakdown under a strain of 6,000 volts (A.C.) per mm. (152 volts per mil.)	70°—90° C.	70°—90° C.	70°—90° C.	70°—95° C.
Volume resistivity at atmospheric temperature—ohms per cm. ³	10 ¹²	—	10 ¹²	10 ¹²
Surface resistivity at atmospheric temperature—ohms per cm. ²	10 ¹¹ —10 ¹²	—	10 ¹²	10 ¹¹ —10 ¹²
Weight per cubic inch	0.86—0.95 oz.	0.825 oz.	0.82—0.92 oz.	0.84—0.92 oz.
Apparent density of powder	0.50	0.65	0.57	0.70
Moulding contraction	(Densified, 0.70) 0.08 per linear inch	0.011 per linear inch	0.08 per linear inch	0.08 per linear inch
Coefficient of expansion	0.00045 per °C. (0.00025 per °F.)	—	0.00038 per °C. (0.00020 per °F.)	0.00043 per °C. (0.00024 per °F.)

